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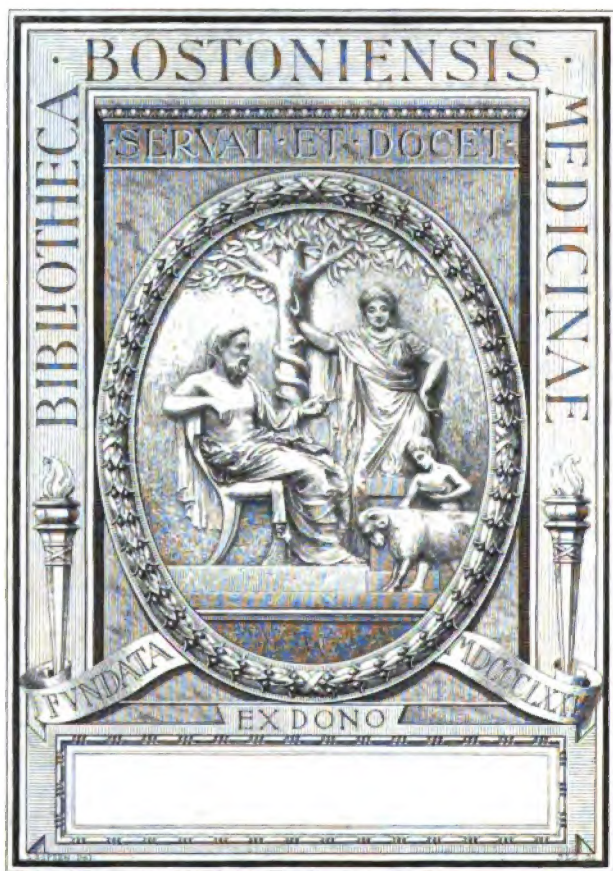
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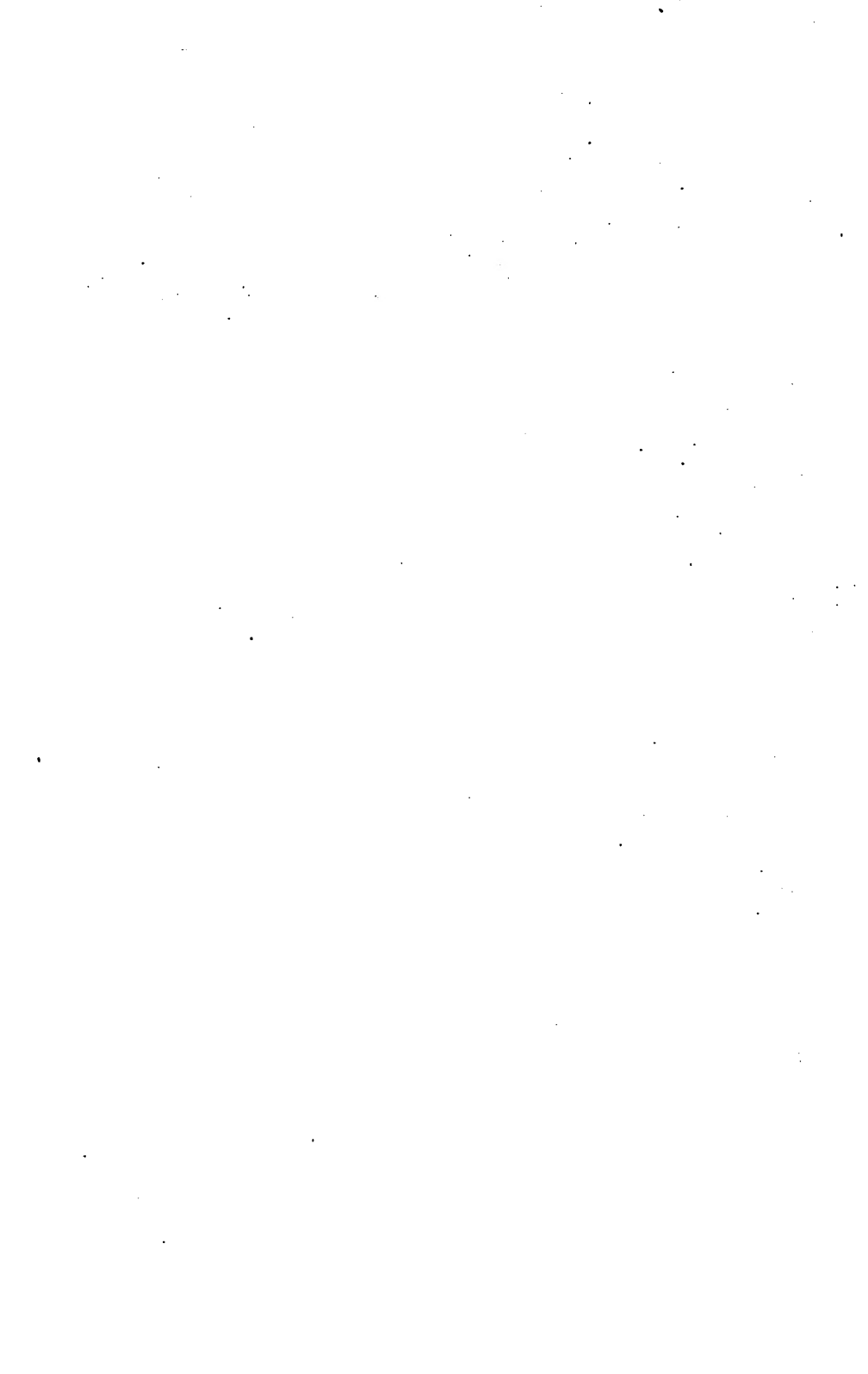
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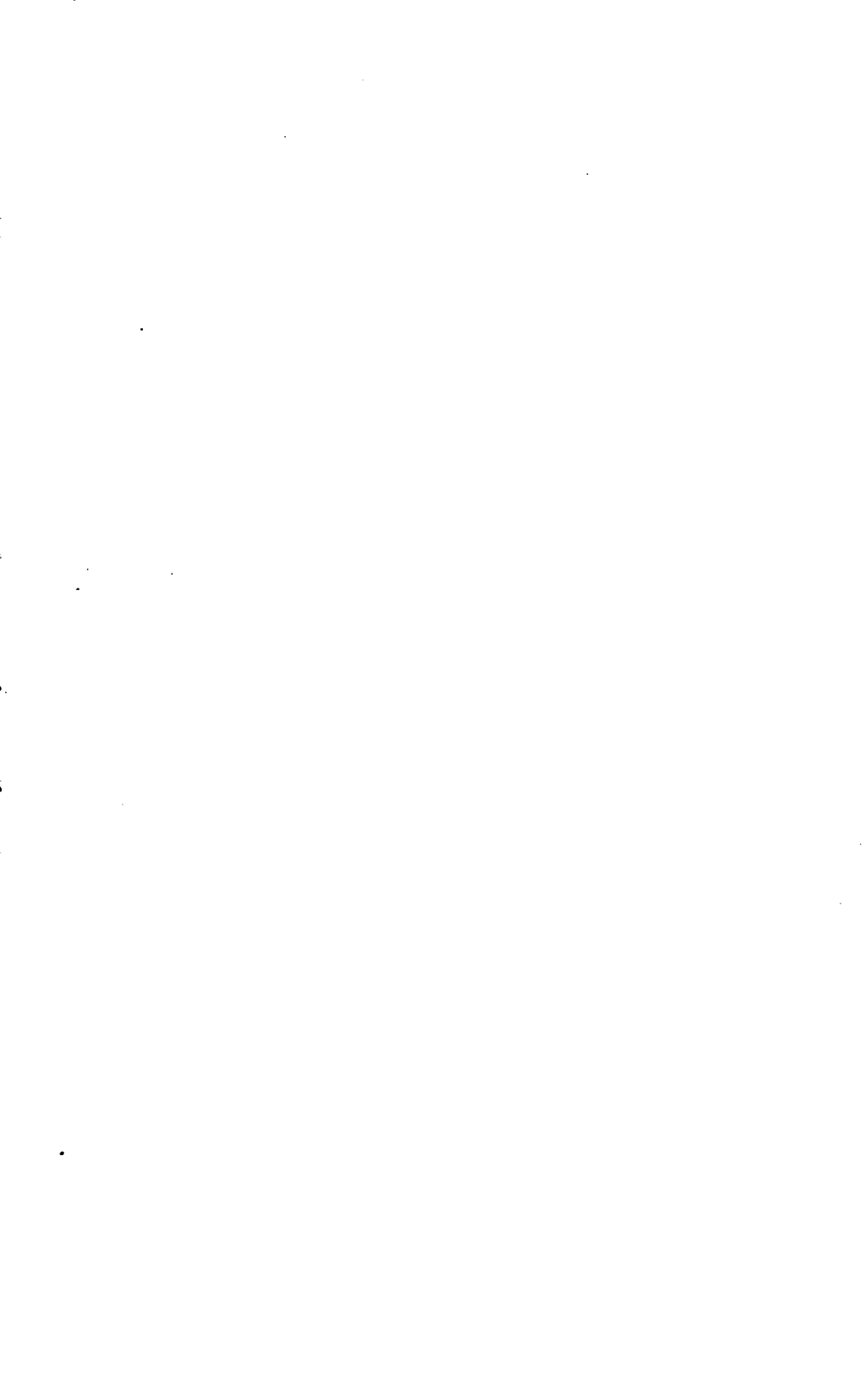
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ALBERT ETHELBERT EBERT.

Born in Bavaria, Germany, December 23, 1840. Died at Chicago, Ill., November 20, 1906.

President of the American Pharmaceutical Association, 1872-1873.

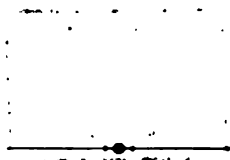
Third Vice-President, 1868-1869.

PROCEEDINGS
OF THE
AMERICAN
PHARMACEUTICAL ASSOCIATION

AT THE
FIFTY-FIFTH ANNUAL MEETING

HELD AT
NEW YORK, N. Y., SEPTEMBER, 1907.

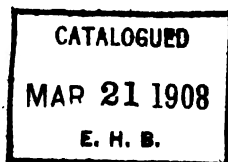
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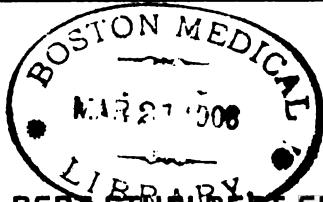


BALTIMORE:
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1907.



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ALBERT E. EBERT.

BIOGRAPHICAL SKETCH.

ALBERT E. EBERT was born in Bavaria, Germany, December 23, 1840, and came to this country with his parents in 1841. His father was a horticulturist and gardener, and with his family settled in Chicago, where later young Albert received a part of his education in public and private schools.

In October, 1853, he entered the drug store of F. Scammon & Co., 140 Lake Street, Chicago, where he served for four years as an apprentice. He then entered the store of Henry Bronold, with whom he remained two years, familiarizing himself with German pharmacy, at the end of which period he returned to the old store, which, in the meantime, had changed owners and had become the store of Sargent & Ilsley. Here he took charge of the retail department, remaining until 1861. In 1859, on the organization of the Chicago College of Pharmacy, he enrolled himself as a student, and attended lectures in that institution until 1861, when the course was suspended, owing to the breaking-out of the Civil War.

Young Ebert then entered the employ of Dr. F. Mahla, a distinguished chemist of Chicago, with whom he remained two years. In 1863 he entered the Philadelphia College of Pharmacy, graduating therefrom at the head of his class in 1864. During this time he was also a student in the medical department of the University of Pennsylvania, and was associated with Prof. Edward Parrish in the school of pharmacy for the training of applicants to the medical departments of the army and navy, and for students preparing for examination in medical colleges.

In 1864 he attended the meeting of the American Pharmaceutical Association in Cincinnati and was elected a member. Returning to Chicago he became the manager of the retail and manufacturing department of E. H. Sargent & Co., where he remained for three years, gaining quite a reputation as a chemist. Desiring to prosecute his studies still further, Mr. Ebert next went to the University of Munich, Bavaria, where he studied under Professor Justus Von Liebig and under Wittstein, in whose laboratories he completed his studies, receiving the degree in philosophy. With Professor Procter of Philadelphia and John Faber of New York, he represented the United States at the International Pharmaceutical Congress in Paris in 1867, after which he traveled for several months with Professor Procter in Switzerland, Germany and France.

Soon after this Mr. Ebert went to Dundee, Scotland, as a delegate from the American Pharmaceutical Association to the British Pharmaceutical Conference, and was made an honorary member of that body. During his stay in Great Britain he made the acquaintance of the leading chemists and pharmacists of that country, his letters of introduction from Liebig, Wittstein, Procter and others giving him unusual facilities for observation and instruction among the teachers of chemistry and pharmacy.

In 1868 Mr. Ebert returned to Chicago and opened a pharmacy at Twelfth and State Streets, from which he retired in 1877, after having made a fortune, in order to devote

ALBERT ETHELBERT EBERT.

himself to the manufacture of grape-sugar and glucose at Milwaukee, Peoria and Chicago. He invented the sulphurous process for the manufacture of starch and glucose.

Having lost most of his money in the glucose business, then a new venture, in 1883, Mr. Ebert purchased the pharmacy at the northwest corner of State and Polk Streets, and in the following year acquired another store at the southwest corner of Madison and Halstead Streets. The management of the latter proving uncongenial he sold it after a few years and continued at the State Street Pharmacy until this year, when he was forced to move a few doors west.

In 1868 "The Pharmacist," a publication of the Chicago College of Pharmacy, was started, and Mr. Ebert became its editor, a position which he held until 1876. This publication, in 1887, was merged with the "Western Druggist."

Mr. Ebert was Professor of Pharmacy in the Chicago College of Pharmacy, and was chiefly instrumental in securing the admission of the College into the University of Illinois in 1896, being a member of the Advisory Board ever since. He was Vice-president of the American Pharmaceutical Association in 1868 and President in 1873, when he founded the Ebert Prize for scientific research, the original donation of \$500 now amounting to \$900. He was on the Committee for the Revision of the United States Pharmacopœia in 1870, was vice-president of the national convention for its revision in 1890, and was again a member of the convention in 1900, being elected a member of the Board of Trustees of the Pharmacopœial Convention. He has been a prominent contributor to the leading pharmaceutical journals for many years and in collaboration with A. Emil Hiss, he prepared the Standard Formulary. Mr. Ebert served five years on the Illinois Board of Pharmacy, and was a member of the Chicago Historical Society, the Academy of Sciences, etc.

He was married in 1871 to Miss May L. Whiteley, who died April 10, 1906.

While in apparent good health, Mr. Ebert for many years was suffering from some intestinal complaint, aggravated in recent years by a diabetic tendency. The loss of his beloved wife was a severe blow to him, and some of his most intimate friends expressed doubts as to his being able to successfully withstand the shock. On Sunday, November 4, he visited President Eliel in South Bend and spent the day pleasantly in company of Messrs. Meissner, Wooten and Hallberg, their wives, and Messrs. Meyer and Reyer and their families. Two days after his return he had a severe chill, complained of his old trouble, and on advice of his physician went to bed. Nothing serious was expected, and the following Tuesday, at the Branch Meeting, one of the physicians reported that Mr. Ebert was out of danger and would soon be about. He quickly took a turn for the worse, however, and on Saturday was removed to St. Luke's Hospital to be operated on, the disease having been diagnosed as appendicitis. An abscess having formed, a preliminary operation was performed, Sunday night, which he stood well, but which left him in such a condition, superinduced by his diabetic state, that he began to lose ground the following night, and passed away peacefully Tuesday, November 20, at 4.45 p. m., in the presence of Mr. and Mrs. Whiteley, his nearest relatives, and Dr. Hugh Wisdom.

His first and last thought was of the Association and its work. His last words, while on his death-bed, were: "The American Pharmaceutical Association, it was my life; it gave me a profession!"

Never in the history of Chicago was there such an outpouring of druggists and persons connected with the drug trade as assembled at the Chicago College of Pharmacy, Friday morning, November 23, to pay respects to their departed friend. The simple cloth-

ALBERT ETHELBERT EBERT.

covered casket was placed in the Chemistry Lecture Hall against a background of floral offerings, imposing in splendid beauty, by the pall-bearers, comprising the following members of the Chicago Veteran Druggists' Association: Messrs. T. N. Jamieson, Jno. Blocki, W. Bodemann, W. K. Forsyth, F. J. Schroeter and F. M. Schmidt. The Imperial Quartette rendered "Lead, Kindly Light," and C. S. N. Hallberg introduced the President of the Chicago Veteran Druggists' Association, Theo. H. Patterson, who referred feelingly to the deceased, and called on the Secretary, W. Bodemann, who read the resolutions adopted at a special meeting, and also spoke of his long acquaintance with Mr. Ebert and his good qualities.

The principal address was made by Geo. P. Engelhard, who analyzed the peculiar attitude of Mr. Ebert in matters spiritual, and rendered most appropriately Thanatopsis from William Cullen Bryant. As the speaker dramatically turned to the bier and eloquently called on the spirit of Ebert to answer, the several hundred friends present realized that while the "man" Ebert was gone his "spirit" lives and will continue to be an inspiration to all who have pharmacy dear to their hearts. Short addresses were made by Leo Eliel, President of the American Pharmaceutical Association, Dr. H. M. Whelpley on behalf of the Trustees of the Pharmacopœial Convention, and for the Chicago College of Pharmacy Faculty and the University of Illinois by Professor Wm. B. Day.

This closed the exercises and the cortege wended its way up Michigan Boulevard by special permission of the authorities to Graceland Cemetery, where all that remained of Albert Ethelbert Ebert was laid alongside of his departed, dearly beloved wife, as was expressed by both of them, their dearest and last wish on earth.

Among institutions represented were the following: Chicago Veteran Druggists' Association, American Pharmaceutical Association, Chicago Branch of American Pharmaceutical Association, United States Pharmacopœial Convention Trustees, Chicago College of Pharmacy, Alumni Association, University of Illinois, Northwestern University School of Pharmacy, St. Louis College of Pharmacy, Purdue University School of Pharmacy, Philadelphia College of Pharmacy, Illinois Board of Pharmacy, Illinois Pharmaceutical Association, Missouri Pharmaceutical Association, Indiana Pharmaceutical Association, National Wholesale Druggists' Association, National Association of Retail Druggists, Chicago Retail Druggists' Association, Chicago Drug Trade Club, Chicago Social Drug Club.



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THOS. F. MAIN, New York, N. Y. CORNELIUS VAN SCHACK, Chicago, Ill.

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President in compliance with the following resolutions:

Resolved, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

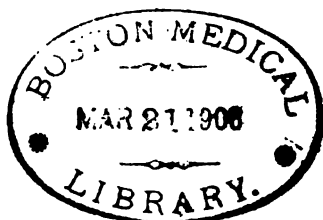
Resolved, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

Resolved, That whilst it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

<i>Arkansas,</i>	John B. Bond, Main and Fifth streets, William L. Dewoody,	Little Rock. Pine Bluff.
<i>California,</i>	William T. Wenzell, 1998 Ocean Blv'd,	San Francisco.
<i>Dist. of Columbia,</i>	Walter G. Duckett, 22d st. and Penna. ave.,	Washington.
<i>Connecticut,</i>	John K. Williams, 391 Main street, Warren A. Spalding, 19 Church street,	Hartford. New Haven.
<i>Delaware,</i>	Herbert K. Watson, 803 Market St.,	Wilmington.
<i>Georgia,</i>	Robert H. Land, 812 Broad street, Thomas A. Cheatham, Mulberry & 3d Sts.,	Augusta. Macon.
<i>Idaho,</i>	David E. Smithson,	{ Emmett, Can- yon Co.
<i>Illinois,</i>	C. S. N. Hallberg, Mich. Blv'd & 12th st.,	Chicago.
<i>Indiana,</i>	Frank H. Carter, 776 Massachusetts avenue,	Indianapolis.
<i>Iowa,</i>	John W. Ballard, 106 West Second street, George H. Schafer, 713 Front street, Silas H. Moore, 525 Fourth street,	Davenport. Fort Madison. Sioux City.
<i>Kansas,</i>	George Leis, 747 Massachusetts street,	Lawrence.
<i>Kentucky,</i>	C. Lewis Diehl, 1346 East Broadway,	Louisville.
<i>Louisiana,</i>	Fabius C. Godbold, 2728 Prytania St.,	New Orleans.
<i>Maine,</i>	Noah S. Harlow, 4 Smith's Block, Edward A. Hay, Free and Middle sts.,	Bangor. Portland.
<i>Maryland,</i>	D. M. R. Culbreth, 1307 N. Calvert street,	Baltimore.

<i>Massachusetts,</i>	S. A. D. Sheppard, 1129 Washington street, B. Frank Stacey, Thompson Square, James E. Blake, 96 North Second street, Thomas B. Nichols, 178 Essex street,	Boston. Charlestown. New Bedford. Salem.
<i>Michigan,</i>	Ottmar Eberbach, 12 South Main street, James Vernor, 33 Woodward avenue,	Ann Arbor. Detroit.
<i>Minnesota,</i>	Wm. A. Frost, cor. Selby & Western aves.,	St. Paul.
<i>Mississippi,</i>	Joseph W. Eckford, Commerce street,	Aberdeen.
<i>Missouri,</i>	James M. Good, 2348 Olive street, George Eysell, 1036 Union ave.,	St. Louis. Kansas City.
<i>Nebraska,</i>	Autumn V. Pease,	Fairbury.
<i>New Jersey,</i>	Wm. M. Oliver, 132 Broad street, Hermann Klussmann, Fourth st. & Lafayette ave., Maxwell Abernethy, 188 Newark avenue, Clarence P. Smith, 861 Broad street,	Elizabeth. Hoboken. Jersey City. Newark.
<i>New York,</i>	Charles H. Gaus, 202 Washington avenue, Rudolf C. Werner, 2592 Atlantic ave., Charles O. Rano, 1872 Niagara street, William L. Du Bois, 281 Main street, John Hepburn, 103 Main street, James T. King, Main and South streets, John McKesson, Jr., 91 Fulton street, Charles F. Fish, 348 Broadway, Charles W. Snow, 214 Warren street, William Blaikie, 202 Genesee street,	Albany. Brooklyn. Buffalo. Catskill. Flushing. Middletown. New York. Saratoga. Syracuse. Utica.
<i>North Dakota,</i>	Henry L. Haussamen,	Grafton.
<i>Ohio,</i>	J. U. Lloyd, Court and Plum streets, Thomas J. Casper, 41 East Main street,	Cincinnati. Springfield.
<i>Pennsylvania,</i>	Jacob A. Miller, Second and Chestnut streets, Joseph L. Lemberger, 5 North Ninth street, Richard M. Shoemaker, Fourth and Race streets, Philip M. Ziegler, 526 Penn street, Edward A. Cornell, Fourth and Pine streets, Jas. S. Robinson, Second and Madison streets, Henry E. Holmes,	Harrisburg. Lebanon. Philadelphia. Reading. Williamsport. Memphis.
<i>Tennessee,</i>	Edward Kremers,	Seattle.
<i>Washington,</i>	John R. Drake, 365 East Water street,	Madison. Milwaukee.
<i>Wisconsin,</i>		





MINUTES

OF THE

FIFTY-FIFTH ANNUAL MEETING.

THE Fifty-fifth Annual Meeting of the American Pharmaceutical Association was held in the City of New York, beginning on Monday, September 2, 1907, and continuing throughout the week. The Association had not met in the metropolis of the country for forty years, and great interest attached to this meeting in consequence. Despite the strong attractions of the great city, the attendance upon the various sessions was good, and the interest was decided and sustained. The list of new members was a record-breaker, and some 350 new names were added to the roll, bringing the total up to considerably over the 2,000 mark, the highest it has ever attained. Many of the wives and daughters of the members graced the meeting with their presence, and the local committees made it a memorable week in the matter of ample and delightful entertainment.

FIRST SESSION—MONDAY AFTERNOON, SEPTEMBER 2, 1907.

The Association was called to order at 3:15 p. m. by President Leo Eliel, of South Bend, Ind., in the beautiful ball-room of the new Hotel Astor, on Upper Broadway, which was also headquarters throughout the meeting, and where all the sessions were held. In the absence of Mayor George B. McClellan, who was to have delivered an address of welcome on behalf of the municipality of New York, the President called on Local Secretary Thomas P. Cook to say a few words of greeting, and Mr. Cook bade the members a hearty welcome to the city in the name of the Mayor, and bore special greeting from the pharmacists and manufacturers and jobbers of the metropolis.

Mr. William C. Alpers was next called upon, and welcomed the Association on behalf of the 2,000 pharmacists of the City of New York. His address of welcome was characterized by great cordiality, enthusiasm and spirit. Nobody could doubt the sincerity of the welcome accorded after Mr. Alpers had spoken. In the course of his remarks he referred to the

long period of forty years that had elapsed since the Association had met in New York, and paid a high tribute to its glorious work for pharmacy in America during that period.

The President called attention to the presence of Dr. Solomon Solis-Cohen as the representative of the American Medical Association before this body, and invited him to address the Association. Dr. Solis-Cohen was greeted with enthusiastic applause as he arose to speak, and addressed the Association as follows :

Mr. President and Friends of the American Pharmaceutical Association :

It is my pleasure on behalf of the American Medical Association to extend to you hearty congratulations and fraternal greetings. The great progress which your Association has made in scientific achievement and along ethical lines has been observed by the American Medical Association with great delight, and we on our part have taken every encouragement and inspiration from your endeavors in our common need, for—let those who wish it otherwise say what they please—there is, and always will be, between the true physician and the true pharmacist the most cordial, the most brotherly relation. (Great applause.)

On behalf of the Association which I have the honor to represent—the only organization that can possibly claim to voice the sentiment of the united medical profession—I have already discharged a pleasant duty, and now I beg your indulgence for a few moments to say something for myself, because I do not care to make the American Medical Association responsible for any personal utterance. I feel, however—and I have the right to feel—from my talks with my colleagues and from our work in common in the Section on Pharmacology, which I more immediately represent, and also in the Section of Medicine, and from all that I can gather from those journals which have the right to speak for the dignified medical profession of the United States—I say, from all these things, I believe that what I have to say is shared by the physicians; yet after all I cannot speak officially except in the restricted official terms.

For the last few years pharmacists and physicians, working hand in hand, have set themselves to change some of their mutual errors and mistakes of the past. It lies not in the mouth of the physician to reproach the pharmacist, nor in the mouth of the pharmacist to reproach the physician. We have erred mutually, we have erred together, and we are determined to redeem ourselves together. (Applause.) The mere trade in patent medicines, in frauds and fakes, the deceit of all kinds, need not concern us. There are crimes outside of the ranks of medicine and outside of the ranks of pharmacy, and we are not starting off on a general reform expedition. There are other organizations and other agencies for that purpose; but the movement to make the drugs—whether the product of the manufacturing houses or the product of the individual pharmacist—which are dispensed over the counter upon our prescriptions, what they purport to be, is one in which you and we have a common interest, and in which our patients have the greatest interest of all. I recognize and you recognize—we must recognize—that in the general progress of science and the general advance of discovery and the general progress of the arts of manufacturing and preparation of crude pharmaceuticals there is abundant room for large manufacturing houses which devote themselves to specialties of various kinds. For example, how can the individual pharmacist undertake to prepare and supply the great group of animal extracts and serums which now have such a large part in the therapeutics of to-day? And so even with the various galenicals, alkaloids and the like. There are many things which the retail pharmacist cannot do as well as that establishment which possesses the proper facilities and which is thoroughly organized to

do well on a large scale what can only be done imperfectly on a small scale. We all recognize that, and the American Medical Association has taken steps, individual physicians have taken steps, to place themselves in proper relation with the great manufacturing houses which are a credit to American pharmacy and to American business. We want to have the most cordial relations with them, so that these firms may be encouraged to prepare and offer to us for the benefit of our patients the best and purest and most definite pharmaceutical products. And yet after all there is a place, and there must be a place always, for the individual pharmacist—the retail druggist, call him by whatever name you please—for the individual who practices as a scientific man the profession of pharmacy. (Applause.)

I have no reproach to cast upon trade. Trade is necessary; trade has built up the country, and will continue to build up the country. Trade has given to the physician and to the pharmacist the products of distant lands, which the individual could not get at and gather for himself, and trade and pharmacy are often, on the part of the individual, necessarily associated. But I do quarrel—I have an intense and personal and professional and unending quarrel—with those who wish to say that pharmacy is *only* a trade; and a still more bitter quarrel with those who reply to all questions of justice and progress and truth and honor, "Oh, that is a matter of ethics, but this is a matter of business!" (Applause) Now my father was a man of business, and I take it as a personal insult to his memory when anybody says business and ethics cannot be carried on hand in hand; that there is anything whatever in trade or commerce which necessarily imposes falsehood and lying and dishonesty upon man. It is not true, and the men who should resent it the most are the business men, the men of pure business themselves. The profession of pharmacy and the business of pharmacy and the trade of pharmacy *can* go along all together upon the most noble principles, and upon the strictest ethics; and unless there is a stringent standard of ethics held by all such associations as this and its branches, and unless that standard is strictly enforced upon all the members, upon the manufacturing firms and upon the individual pharmacists and upon the pharmacists' clerks, and upon the professors in the colleges, and the authors of the text-books, and the students and all—I say unless this standard is held up and its rules enforced, then pharmacy as a science is doomed to disappear, and the trade of furnishing drugs will fall to the level of the patent-medicine business—and I know of no lower one.

The dependence of the patient on the physician is reflected in the dependence of the physician on the pharmacist. It is true that the greatest advances which have been made in medicine are those of preventive medicine, hygiene and sanitation. We are aiming to teach the people how to live rightly and to avoid disease. We aim to teach communities how to purify their water and keep their streets clean, and incinerate their garbage and do all things necessary to wholesome environment to the individual. It is also true that when disease has occurred we make use of what I have ventured to term Physiologic Therapeutics, the use of air and sunlight—other methods than that of drugs; food and water and exercise: all these methods which are most potent in restoring man to his normal condition. Yet, beyond the domain of preventive medicine, and beyond the domain of physiologic therapeutics, is that great domain of disease to which remedy and alleviation can be applied best by those means which you gentlemen of the American Pharmaceutical Association give to the physician. You, by your science and your skill, by your knowledge of chemistry and your industry, search the world over to find means by which the physician may relieve the distress of his patient; and when a thing does not exist in nature, you chemists go into the recesses of your mind and search it out there and produce it by your skill, and give it to us; and for that we and our patients are thankful. We depend upon you, therefore, to prepare for us that which exists in nature and to find for us that which art alone can furnish.

Going back once more to what I said in the beginning, if you have made mistakes in trade, or science, or art, and if we have made mistakes upon our part, I say that we are not to get together for recrimination, but we are to get together for amendment and improvement; we are to work for the elevation of medicine and for the inseparable progress of pharmacy. (Tremendous and long-continued applause).

Mr. Edward Williams, Chairman of the Delegation from the National Association of Retail Druggists to this Association, was the next speaker, and extended hearty greetings on behalf of the body he represented, assured the members of the high esteem in which the American Pharmaceutical Association is held by his Association, and expressed their appreciation of the noble work done by this Association in the past fifty years for the betterment of American pharmacy. He thought that there was ample room for the activities of both Associations, the one standing for the scientific and professional side of pharmacy, the other standing for the betterment of the financial condition of the retail pharmacists, which meant more time and greater opportunity for professional advancement. Such a condition, he thought, would appeal to young men to make pharmacy their life-work. Commercial integrity should be the motto of every true pharmacist, and his Association was engaged in endeavoring to eliminate trade jealousies, and stood for the adoption of honest business methods, at the same time teaching the value and necessity of organization.

Mr. A. M. Roehrig, of Stapleton, Staten Island, spoke for the United States Public Health and Marine Hospital Service. He said this was the sixth time that he had had the honor of representing his branch of the government service at the annual meetings of the American Pharmaceutical Association, and he recalled with pardonable pride that Surgeon-General Wyman was the first government official to respond to the invitation of this Association to send representatives to its annual meetings. He thought a vast amount of good and mutual benefit had already resulted from the establishment of such amicable relations, one marked evidence of which was the establishment and maintenance by the Public Health Department, at the request of this Association, of a standard for diphtheritic antitoxin, which is now officially recognized by the United States Pharmacopœia; also the National Pure Food and Drug Law recently enacted is the result of co-operation between this and kindred organizations and the several departments of the government service; and the United States Pharmacopœia and the National Formulary—the latter the distinct product of this Association—are now recognized by law as the standard of purity for drugs and medicines.

Mr. Paul J. Waldner, of Brooklyn, spoke as the representative of the United States Navy, and said that the Navy, through Surgeon-General Rixey, stood always for the best in pharmacy. He said that the last four men appointed in that arm of the service were graduates of the Philadelphia College of Pharmacy, "the mother of us all," and expressed the

hope that the lights of pharmacy, "the old red and green, would always, like those of our Navy, shine clearly, dead ahead."

The President announced the presence of Dr. H. W. Wiley, Chief Chemist of the United States Department of Agriculture, and called on him to address the Association. Mr. Eliel took occasion to pay some handsome verbal compliments to Dr. Wiley's high standing and ability. Dr. Wiley was greeted with spontaneous applause as he rose to speak, and addressed the convention as follows :

Mr. President and Members of the Association, Ladies and Gentlemen :

I do not bring any greetings from the farmers of the country, but I am sure that you could not do without us. And yet the Department from which I come—not in any official way, for I come merely as a member of this Association; that is honor enough for me, Mr. President—I say, the Department of Agriculture is greatly interested in the work of this Association. You may not know that we have an office in that Department expressly devoted to introducing in this country new plants which have medicinal qualities and to improve the medicinal qualities of those plants already existing in our country; for we believe that the farmer is entitled to his share in the advancement of the great professions, and entitled to whatever profit he can get by the production of drugs, and that is the interest which the Department of Agriculture has in your Association from the standpoint of the farmer. We believe the farmer stands at the foot of society, on which all of you "tall buildings" rest—a pretty heavy load to carry, some of you. (Laughter). We believe in farm products for the American farmer. It may be selfish, but it is patriotic. What do we look for the first thing in the morning after looking at the weather reports in the daily papers? We look for the report of the crops. There is not a business man in New York that does not turn every day eagerly to see the condition of the crops in the United States, because everyone of them knows—everyone of *you* know—that on the condition of the crops depend the markets, depends all the prosperity of our country. Now, if we can add anything to the welfare and the wealth of the farmer by the cultivation of drugs, we add that much to the foundation life of our country.

Then we are interested again in your Association from another point of view: You have already heard the eloquent appeal for high ethics in the profession of pharmacy and the profession of medicine made by Dr. Cohen. I endorse most heartily every word which has been said on that interesting subject, and we must depend always upon the moral sense of the public for every great reform. Mr. President, you never can reform anybody by an act of Congress, any more than you can get people into heaven by a resolution of an Ecumenical Council. It depends on the people themselves whether you reform or not, and whether you get to heaven or not. But the latter is an experience yet to come; I am under contract to live a hundred years, but still the last few years are the most important to me. If it were not for the moral and ethical sentiment of the people of the country, the laws would be of no effect. You cannot enforce a law against public sentiment, I don't care what that law is. Look at our friends, the English, who are trying to enforce the laws in Ireland, a helpless country, against the public sentiment of that small island, and see the great difficulty that great empire has in enforcing those laws. So unless a law has the moral sentiment of the public behind it, it is a dead letter.

Now what is the force of the Pure Food and Drug Law to-day? It is the power of the great public sentiment of this country which is behind it, and this organization was one of the first that stood for that law from the very beginning. Withdraw to-day from

that law the force of your great organization, and the moral power which is behind it, and you will paralyze the arms of every official who has anything whatever to do with the enforcement of that act. Why is it that the Pure Food and Drug Law has gone into effect, and radical effect, without a single suit at law, without anybody whatever being cited before a court? Why is that? It is because we have behind that law the moral sentiment of the people of the United States, and that moral sentiment has been moulded by this and similar organizations interested in this question.

And so Congress can only reform trade as trade reforms itself. Now take trade at the time the law went into effect, take the drug trade, the food trade, and we all know that the overwhelming majority of trade is, as said by Dr. Cohen, ethical. It is useless to decry trade as a whole because some people are unethical. Trade is ethical, the very basis of trade is ethics; and as soon as you strike that foundation out it crumbles and falls. Now what is the life of trade? Honor, honor among tradesmen. This is the life of business, honor among business men. When you send your check to a distant city is it returned unpaid? Not at all; it is as good as gold, because the people believe in the honor of your name. Strike out to-day the confidence in the honor and honesty of the business men of the country and the whole system will crumble and fall to the ground.

Of course trade and commerce are not in all cases what we should like to see; but I believe that American commerce and trade are sound at the core, and that is the reason that American trade and commerce are a power in this and in other countries, and for no other reason.

And so this Pure Food and Drug Law crystallizes that sentiment. Its whole intent, so far as its legal effect is concerned, is to protect the ethical part of trade against the unethical, so that the ethical man in trade will not be brought in competition with the unethical. One man can demoralize business just as one railroad can demoralize rates, and all the members of trade are affected thereby, no matter how honest or conscientious the individual member may be; and the object of the law is to protect the ninety-eight per cent. of ethical people against the two per cent. who want to do business in the dark. That is the sole object of the law, and it is because the ninety-eight per cent. want it all good that the two per cent. can be made good by Act of Congress, or at least prevented from doing wrong.

So our department is interested in the subject because Congress has placed the administration of this law in the United States Department of Agriculture, both as to foods and drugs; and I may say that the only object it has kept in view in the administration of this law has been this: That the man who wants to do business on the ethical basis shall be allowed to do so, without that demoralization which the unethical man produces in trade. (Great applause).

Now Mr. President, we depend upon your organization and others like it to hold up our hands. We are by no means infallible. We must make many mistakes. We will do many things that are not right. The only man who does nothing that is not right is the man that does nothing at all. We want you to point it out to us if we go wrong, and we want you to hold up our hands if we are right; we want you to criticize us when wrong and stand by us when right. And it is this Association and the great American Medical Association and others of that description that will make this law possible of successful enforcement, and make it rich in the fruition of blessings to all the people. (Great and continued applause).

The President stated that the Board of Trustees of the United States Pharmacopœia had very wisely provided for the translation of the Pharmacopœia into Spanish, and that the author of that translation was present in the room, and he would call on Mr. J. P. Remington to intro-

duce the gentleman to the Association. Mr. Remington, in a few well chosen words, then introduced Professor José Guillermo Diaz, of the University of Havana, Cuba, and a member of this Association; and Professor Diaz, after asking indulgence on account of his somewhat limited knowledge of the English language, read the following address:

Ladies and Gentlemen.—Not to any merit on my part, but to your indulgence, is due the honor of permitting me to be present and to take part in your meeting. I regret that lack of time has prevented me from preparing a paper on some professional subject; and consequently I will limit these few lines to stating the motives that induced me to undertake the translation into Spanish of the eighth revision of the United States Pharmacopœia, and to express my gratitude.

Because of the deficiencies of the French and Spanish pharmacopœias, which in many respects have not kept abreast of the advances made in our profession, I found that in my lectures and laboratory work at the school of Pharmacy of the University of Havana, I had frequently to refer to and use the U. S. Pharmacopœia, but I was compelled, on account of my pupils' imperfect knowledge of English, to translate and to explain every day the preparations mentioned in your book and at times to turn into Spanish entire chapters of an American text-book.

To tell of these difficulties is a matter of few words, but it is almost impossible to realize what it really meant in practice, on account of the time and work it demanded. This gave me the idea of the desirability of translating the entire work.

I consider your Pharmacopœia the most complete and most useful work of its kind yet published; I refer both to the text and to the notable appendices which complete the work; that for instance, not to cite more than one, "Tests, Reagents, Test-Solutions and Volumetric Solutions" for its clearness and precision has no equal in any of the European pharmacopœias. I sincerely believe your work will be of great value and of unquestioned utility to the Spanish-American Republics and that it will fill a professional necessity in Puerto Rico and the Philippine Islands. As to Cuba, I can assure you that the profession there look forward with pleasurable expectancy to be able to read your work in their own language. So highly is your work esteemed in Cuba that in the new "Pharmacy Law" lately drafted, which only awaits the sanction of the Provisional Government to become operative, we have requested that the Spanish edition of your work be declared official down there. In asking the government to accept this suggestion we alike acknowledge the true value of the work and the close relations which unite Cuba to your powerful country.

Before deciding definitely to undertake the translation, I vacillated, thinking it too great a task for me and even went so far as to decline to agree to do it, but encouraged by Dr. Guiteras of Havana and by Prof. Remington, who wrote me several kind letters urging me to take up the work, I finally consented. Not until the contract with the U. S. Pharmacopœial Convention was signed on July 1st, 1906, did the honorable Professor cease to write me, urging me in the matter. I wish to make acknowledgement of these facts and of my deep gratitude to him.

In order that you may form an idea of how highly your book is appreciated in Cuba I will quote (such as I remember them now) the words that a Cuban pharmacist, Mr. Alonso Cuadrado wrote on the advantages of the U. S. Pharmacopœia: "The superiority of the American Pharmacopœia when compared with those of Europe appeals to me thus: While the latter echo the restricting vote of the governments which nominate the respective committees, the Pharmacopœia of the United States reflects the advantages of universal suffrage."

I shall not readily forget this, to me, a memorable day, for your kindness, and the

honor and distinction you have shown me. I feel that these honors are not for me alone, but to my professional confreres in Cuba also, because, I assure you, that they will feel grateful to you for the attentions accorded me; for there is not a true Cuban who does not feel for this great, noble and generous nation, deep admiration, gratitude and love. We do not forget that it was your people who, in the period of fifty years, without being a warlike people, twice drew the sword to break the chains of slaves.

- The Chair next called upon Mr. W. M. Searby, of San Francisco, one of the Association's old and honored members (afterwards made President of the Association for the ensuing year at this meeting), to speak as the representative of the Pacific Coast in acknowledgement of the warm words of welcome that had been extended, and most acceptably did Mr. Searby perform this pleasant duty. He was exceedingly gracious and hearty in his expressions of appreciation of the splendid welcome accorded to the Association by the New York pharmacists, and he took occasion to say a good word for the ethical side of pharmacy. He also took occasion to acknowledge with deep feeling the many acts of substantial kindness shown the pharmacists of California by the drug trade of America, by this Association and the National Association of Retail Druggists in particular, in their recent time of dire calamity.

The President called on Mr. Thomas F. Main, of New York, Chairman, to present the report of the Committee on Credentials appointed by the Council at its session this morning. Mr. Main presented the following report, showing seventy-three associations or organizations presenting credentials which had been approved :

REPORT OF THE COMMITTEE ON CREDENTIALS.

To the President and Members of the American Pharmaceutical Association :

Your Committee on Credentials beg leave to report that they have examined the credentials presented by delegates of the various organizations named below and find them in proper form :

Colleges of Pharmacy—Albany, Brooklyn, Buffalo, California, Chicago, Maryland, Massachusetts, National, New Jersey, New Orleans, New York, Philadelphia, Pittsburg, St. Louis—14.

Schools of Pharmacy—Cleveland, Northwestern University, University of Kansas, University of Michigan, University of Minnesota, Vanderbilt University—6.

State Pharmaceutical Associations—Alabama, Arkansas, California, Connecticut, Florida, Georgia, Idaho, Illinois, Indiana, Indian Territory, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Nova Scotia, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin—37.

Alumni Associations—Brooklyn College of Pharmacy, New York College of Pharmacy, Philadelphia College of Pharmacy, St. Louis College of Pharmacy, Northwestern University School of Pharmacy—5.

National Associations—American Medical Association, National Association of Retail Druggists, National Wholesale Druggists' Association, U. S. Department of Agriculture, Bureau of Medicine and Surgery of the U. S. Navy, U. S. Public Health and Marine Hospital Service—6.

Local Associations—Essex County Pharmaceutical Association, N. J.; German Apothecaries' Society, N. Y.; Kings County Pharmaceutical Association, N. Y.; Manhattan Pharmaceutical Association, N. Y.; Syracuse Druggists' Association, N. Y.—5.

THOS. F. MAIN, *Chairman*,
JOHN F. PATTON,
J. A. KOCH.

President Eliel announced that the time had now come for the reading of the President's annual address, and Second Vice-President C. S. N. Hallberg, of Chicago, was called to the Chair to preside while that matter was being disposed of. The President then read his address as follows, first warning the members that it was long, and stating that he would take no offense if anyone felt compelled to leave the room before he had finished.

PRESIDENT'S ADDRESS.

Fellow Members of the American Pharmaceutical Association:

Ladies and Gentlemen: An old and time-honored custom makes it my pleasant duty at this time to offer the annual address. This I do with words of greeting and thankfulness for the privilege.

We are meeting here in this city for the first time after a lapse of forty years. What mighty changes have been wrought in this the metropolis of the Western Hemisphere during these four decades; and the changes, progress and development, so apparent here, are typical of like progress of the entire country. Never in the history of civilization has there been such rapid advance and development in the arts and sciences, as during these four decades. Chemistry and pharmacy have kept fully apace with all other lines of human activity. In the admirable address of my immediate predecessor, this great progress was fully outlined, making it unnecessary for me further to expatiate upon this subject.

Inasmuch as the Chairmen of the various Sections cover in their addresses such events of interest as have come up during the past year in their respective branches, I shall not take up your time with such reference.

FORTY YEARS AGO.

However, it will not be amiss at this time, to recall some of the interesting things and events of that meeting forty years ago. In looking over the Proceedings for that year, I was very much impressed with the "Report of the Committee on Progress of Pharmacy," also with the fact that this report was signed: C. Lewis Diehl, Chairman. And this work has been, with the exception of one short intermission, in the same hands. It is to be hoped that it will continue so for many years to come.

There were 120 members in attendance, out of a total membership of 695; of these 90 were reported delinquent. Frederick Stearns was President, but owing to illness was unable to attend. Edward Parrish, of Philadelphia, presided at the opening and read the President's address. Dr. E. R. Squibb, of Brooklyn, was nominated President, but could not accept and suggested Mr. John Milhau, of this city, who was then elected. The Vice-Presidents, in the order named, were: Robert J. Brown, of Leavenworth, Kan.; N. Hynson Jennings, of Baltimore, Md., and Daniel Henchman, of Boston, Mass.; Treasurer, Chas. A. Tufts, of Dover, N. H.; Permanent Secretary, Prof. John M. Maisch, of Philadelphia.

Executive Committee: Thomas S. Wiegand, chairman, Philadelphia; Jas. W. Mill Chicago, Ill.; Wm. Wright, Jr., New York; W. J. M. Gordon, Cincinnati, Ohio; Prof. John M. Maisch, *ex-officio*.

Committee on the Progress of Pharmacy: C. Lewis Diehl, Chairman, Louisville, Ky.; N. Gray Bartlett, Keokuk, Iowa; G. F. H. Markoe, Boston, Mass.; Prof. P. W. Bedford, New York. Committee on Drug Market: Daniel C. Robbins, chairman, New York; Jas. T. Shinn, Philadelphia; Henry W. Fuller, Chicago, Ill.; J. Jacob Thompson, Baltimore, Md.; Samuel M. Colcord, Boston, Mass. Committee on Scientific Queries: Prof. W. Proctor, Jr., chairman, Philadelphia; Prof. Edward Parrish, Philadelphia; G. G. C. Simms, Washington, D. C. Business Committee: Alfred B. Taylor, chairman, Philadelphia; Jas. T. King, Middletown, N. Y.; Geo. C. Close, Brooklyn, N. Y.

The report of the Committee on Drug Market was highly interesting and evoked a long and spirited discussion, bringing out many valuable points. Those taking part in the discussion were: Dr. E. R. Squibb, of Brooklyn; Samuel M. Colcord, of Boston; Prof. Parrish, of Philadelphia; Mr. Milbau, of New York; Mr. Tufts, of Dover, N. H.; Prof. Maisch, of Philadelphia; Prof. Markoe, of Boston; Mr. Ellis, of Philadelphia; Mr. Close, of Brooklyn, and Dr. Pile, of Philadelphia. Among the many things brought out by this discussion it may be of interest to mention that a large quantity of drugs and chemicals, which had been seized during the "blockade running" time in that little unpleasantness which some of you may remember, were sold at auction, without having gone through the formality of an inspection. Most of these were found to be grossly adulterated and others spurious. As for instance: Quinine sulphate, labeled as such, proved to be mannite. Adulterations of cream tartar, oil wintergreen, cinnamon, lemon, etc., were also discussed. Matters pertaining to the Internal Revenue were also brought up, especially the excessive tax on alcohol, showing the little progress made in this particular item, which is of such great importance to the chemical and pharmaceutical interests of this country.

A communication from the East River Medical Association of the City of New York, regarding the refilling of prescriptions was read. This was signed by Dr. John Shraday as Secretary. The discussion of this was led by Mr. Colcord and followed by Dr. Squibb, Prof. Maisch, Mr. Tuft and others. As they could not reach a satisfactory conclusion, the matter of ownership of prescriptions having (like the head of King Charles the First) gotten mixed up with the original matter, action thereon was postponed to the meeting of 1868. As you know, this, for some strange reason, never was settled, and is left as one of the problems for future generations. "There is nothing new under the sun." In President Milbau's address in 1868, he recommends a standing Committee on Unofficial Formulas to prepare a report for publication soon after the appearance of the new Pharmacopœia. He qualified this by stating that this would insure uniformity in prescribing and that it would act as a practical check to a certain species of covert quackery on the part of "Manufacturing Pharmacists," inadvertently countenanced by physicians.

The dues were raised from \$2.00 to \$3.00 per annum.

THE MEMBERSHIP.

I am pleased to note the marked increase in our membership, showing an awakening, and increased interest in the work of the Association. This may be attributed to the establishment of the Branch Associations in the centers of population, also to the Bulletin of the A. Ph. A. The Branches through their work educating the druggists and pharmacists as to the value of affiliation with the Association and the Bulletin through its forceful and able editorials, as well as its careful and selected presentation of matters of general interest, have done much to awaken interest in and keep the members in touch with the work of the Association. In this connection, credit must also be given the National Association of Retail Druggists for organizing the retail trade, educating the druggists in the value of united efforts, placing them in a better position financially, and thus stimulating them to join this, the parent Association. Now that the atmosphere has been cleared, their program of education and propaganda in the various commercial

phases, also in connection with the U. S. P. and N. F., will undoubtedly continue to add to our membership in the future.

The report of our worthy Treasurer will also show a very gratifying condition in the financial affairs of the Association. This is due to our large increase in membership and to the handsome sum realized from the sale of the National Formulary, thus emphasizing the wisdom of retaining control of this valuable property.

FEDERAL LEGISLATION.

Without a doubt, the most important event of the past year was the enactment of the Pure Food and Drugs Act. For the first time since the establishment of this government, has there been a law put on the national statutes which undertakes to control the truthful branding of foods and medicinal products, at least so far as their content of certain substances is concerned. This act is so far-reaching that it will not be possible at this time to venture a prediction as to final results.

One of the most beneficial and immediate results of the enforcement of the Act, will be a recrudescence of that commercial honesty and integrity which is so necessary to establish perfect faith in all commercial transactions.

As a natural sequence of this Act there should be organized a National Department of Health.

One of the fundamental principles of all civilized countries should be the preservation and care of the public health. The proposition is so obvious that it needs no argument. Surely it should be considered as important, and more so, as matters pertaining to Commerce and Labor. A strong effort is now being made by the American Medical Association, for the establishment of a National Department of Health. At a meeting of a special committee of the American Medical Association to aid in the establishment of this department, held in Washington, D. C., December 13-15, 1906, there were also representatives from the American Association for the Advancement of Sciences, from the various departments connected with the U. S. government, various State and local health departments, the various medical and hygienic institutions and associations, physicians and hygienists, sociologists, settlements, charity organizations, civil service reformers, volunteers of America, educational institutions, American Peace Association, etc., one sanitary chemist and two other chemists. The pharmacist was not in evidence. The Association should re-emphasize its position, as being in favor of such a department and should appoint a committee to join the American Medical Association, to aid in obtaining the necessary legislation. We should go still farther and demand representation in this department, since ours is the first National Association to concern itself about public health. Protest against the importance of adulterated drugs and medicine was the immediate cause for the organization of the American Pharmaceutical Association here in this city (New York) in 1851, and its investigation and reform was the most important work during the first decade of its existence.

State boards of health, as at present constituted, do not, in most States at least, present the ideal conditions that should prevail in bodies of this character. There should be at least one pharmacist, one dental and one veterinary surgeon on each and every one of these boards. State institutions, such as, our insane asylums, should have registered pharmacists in charge of their dispensaries. I recommend that proper steps be taken to obtain necessary legislation to bring about such improved conditions in States where such do not now exist.

REFORMATION IN MEDICINES.

The enactment of the Pure Food and Drugs Act must be considered only as a first step in that evolution which is now in progress, an evolution which means so much to us all. It is a step in the right direction and in its final analysis spells "Tell the Truth." I

believe it is due and entirely proper, even at this late hour, to give grateful acknowledgment of the valuable and effective work of *Collier's Weekly* and *The Ladies' Home Journal*, in exposing the fraudulent and, in many cases, dangerous character of proprietary articles on the market. The value of these efforts in arousing public sentiment, and thus aiding in placing the Act on the national statutes, cannot be overestimated.

Inasmuch as many proprietors of secret remedies are misleading the public as to the object and meaning of the government guarantee and serial number, I would suggest that this Association put itself on record in condemnation of this practice. We should use our best efforts to have the manufacture and sale of secret proprietary medicines conducted under the same rules and conditions as obtain in European countries.

I further recommend that the postal authorities be urged to exclude from the mails, all newspapers, circulars, periodicals and other matter used in advertising the various remedies for sexual weakness and lost manhood. Also the so-called female remedies, or regulators. The circulars and other matter sent out by the promoters of the first-mentioned class of remedies are filling our insane asylums. If remedies of the second-named class perform what may be read between the lines, they are criminal, and if they don't, they are frauds. In either case, the government should suppress their sale.

So long as our reputable newspapers, journals, magazines, etc., will accept advertising matter from the promoters and proprietors of nostrums, which claim to cure all the ills that human flesh is heir to, the demand for them will continue. Knowing the falsity of the claims made by these nostrum-venders, is it not our plain duty in every way to discourage their sale and use? Should we not use every effort to obtain national legislation along the same lines as govern the sale of this class of goods in European countries? One of the fundamental principles of this Association is the suppression of quackery, and where could it find a better field for action? Unless we take a decided stand in this matter, it will be found difficult to bring about and permanently retain those closer relations with the medical profession, which are so desirable. In the propaganda now being conducted for those better relations, clean hands and a clear conscience on that score will be of great help.

ELEVATION OF OUR STATUS.

Among the problems confronting the medical profession, some also appeal to us, as, for example, the question; What can be done to educate the public along proper lines of hygiene and sanitation, and especially correction of the false notions concerning medicine, and particularly the position of the retail pharmacist?

While the reporter to the public press is designed to work in this direction, it is evident that some more far-reaching scheme is required to offset the derogatory effect of the efforts of inimical interests and to re-establish and maintain the professional status and business integrity of the retail pharmacist.

There are several medical journals having a large circulation among a certain class of doctors which are chiefly devoted to exploiting the doctors in the interest of certain proprietary medicines. In some instances the publisher and owner of the journal is the manufacturer of the medicines, who thus obtains an advantage over his competitors not contemplated by the postal laws. Since some of these journals are constantly working against the interests of true pharmacy by recommending doctors to dispense their own medicines, etc., I suggest that this subject be referred to the Postoffice Department for inquiry.

THE FOOD AND DRUGS ACT.

Your attention is called to the editorial comment appearing in the "Bulletin" of the A. Ph. A. for February. The matter so clearly set forth by its editor should be referred to the Committee on Legislation with instruction to try to obtain changes in the Act, so that when an article is labeled with a U. S. P. or N. F. title, it must comply with their

standards of purity and strength. The present interpretation of this clause in the Act is clearly wrong, and we should not permit it to stand.

It is possible that some distinction should be made between the U. S. P. and the N. F. The two works are quite dissimilar in that the N. F. does not "lay down any tests" as referred to in the Act. While both works contain pharmaceutical preparations, the more ephemeral and complex of these in the N. F. should perhaps not be subject to as rigid interpretation as are the articles of the U. S. P. The question of solvents, menstrua, color and flavor might be given some latitude if so stated on the label. But in the medicinal strength of the preparations it is firmly believed no variation should be permitted any more than any greater latitude should be given chemicals than afforded by the standards of the U. S. P. and the purity rubric.

Nearly every State in the Union has strict laws governing the sale of narcotic drugs and cocaine. These laws are being generally observed by the retail drug trade, yet from all statistical and other information obtainable there has been no reduction in quantities imported or manufactured in this country, nor in its consumption. Nor is there likely to be until the distribution by importers, manufacturers, manufacturing pharmacists, jobbers, etc., is controlled in such a manner that goods of this character may be traced to the consumer. Physicians should not be permitted to dispense habit-forming drugs, but should be compelled to prescribe for each individual case, same to be dispensed by a registered pharmacist. A majority of the victims of drug habits may be laid at the door of a certain class of physicians. The laws, as they are now, only cover the retail drug trade; there is no restrictive legislation so far as the importer, manufacturer, jobber or physician is concerned, excepting that by special provision they are always exempted from such restriction. It is desirable to check the indiscriminate use of drugs of this class, and I would suggest that the Committee on Legislation and Education take this matter up for serious consideration and report as to best methods for obtaining the necessary legislation.

BOARD EXAMINATIONS.

There are in the United States, approximately, taking population into consideration, eight pharmacies and drug stores to one in continental European countries. Despite this fact there are those who deprecate the commercialization of the drug business and the fact that in a majority of these stores the practice of pharmacy has become a secondary feature. This enormous overcrowding is due in part to laxity in our laws, not being strict enough in educational and other requirements, also in methods of examinations in vogue by most of the Boards of Pharmacy. Under present laws, in most States, examinations are limited to three days. This is entirely inadequate to determine what a candidate can "do." The ordinary methods of examination fall short in determining a candidate's competency. Questions, even with ample time at the disposal of a Board, and the wide range from which they may be selected, are after all but a very imperfect test of real knowledge. The present system of examination, making 75 per cent. or more consist of written questions, is entirely wrong. A recent graduate, or one who has "crammed" from one of the many "quiz compends," could pass such an examination, but what could he "do?" This can not be determined in the short time allotted for such examination. Five days at least should be given for the examination and the practical demonstration of the candidate's ability. Of this at least 75 per cent. should consist of laboratory and prescription work. The laboratory work should consist of assay processes, the preparation and standardization of test solutions, also to the application of tests to determine the purity of the various articles submitted. The prescription work should be of a character to test the knowledge as well as the skill. This would make the grade of registered pharmacists much more difficult to reach, but if we ever expect to elevate the practice of pharmacy to a proper professional standard we will have to

proceed along these lines. If the pharmacist hopes to maintain his professional status, and we assume that this is his desire, he must put himself on a level with his co-laborer and oftentimes chief competitor, the physician; higher standards and more rigid examinations are required. I therefore urge that this Association put itself on record at this time as being in favor of a higher educational standard and more rigid and extended examinations by the Boards of Pharmacy. Also that this Association use its best efforts with the different State Legislatures to that effect.

RECOMMENDATIONS.

I recommend that manufacturers of such articles as aqua ammoniac, acetic, nitric and other acids, be urged to abandon their archaic methods of branding and to adopt modern methods for stating percentage contents. F., FF., FFF., FFFF., etc., may have conveyed a definite idea as to strength fifty years ago, but to-day is entirely without meaning. Branding by degrees Baumé is also unsatisfactory, as this requires conversion to ascertain the strength.

We should offer due notice and after a specified time refuse to accept such goods unless properly labeled.

A great source of annoyance and financial loss to the pharmacist is due to the multiplication of similar preparations by manufacturing houses, under different titles; otherwise reputable houses should refrain from such practice.

This Association should enter protest against further abuse of this character.

I recommend that all motions for appropriations passing through the Council for sums in excess of \$250 be held by members of the Council for seven days before transmitting their vote.

The date for meeting of this Association should be fixed by the new Council, prior to adjournment of each annual meeting.

The present financial status of the Bulletin of the A. Ph. A. is far from satisfactory. Its value as a means of information, keeping up an interest in the work of the Association, its aid in adding to our membership, cannot be overestimated.

I would, therefore, suggest that the annual budget be charged with a sufficient sum to carry it for the entire fiscal year. This would obviate the need of the necessarily slow process of voting by mail, which at times may give rise to vexatious delays.

The agitation on the part of some of the pharmaceutical press, regarding revision of the U. S. P., under the supervision of the National Government, I assume, will neither be pleasing nor appeal to a majority of those who have performed these labors in the past. Nor would a proposition of this kind be pleasing to the many others who are directly interested in the future welfare of this important standard.

Foreign pharmacopœias, so revised, cannot be compared in any respect with the U. S. P. The conditions under which the U. S. P. is revised are the best for this country. The Government has now representation in the Pharmacopœial Convention through its various medical and drug departments, in its different branches of service. This might be enlarged upon, by the Convention electing one of the Government delegates as a member of the Revision Committee. But it is clearly in the interest of all concerned to retain control of the Pharmacopœia under present conditions.

THE LOSS OF EBERT.

The past year, which has brought so many changes in connection with matters of pharmaceutical interest, has also brought great sorrow and grief to our ranks. Stricken down in the period of his greatest usefulness, with his faculties unimpaired, with apparently many years of useful service before him, in the cause to which he had devoted his life, the announcement of the sudden illness and death of the late lamented Albert E. Ebert, came as a distressing shock to the members of this Association, such as it had

never before experienced. His taking-away is an irreparable loss to pharmacy, and leaves a decided vacancy in our ranks.

Those who knew him and were near to him, also knew his kind and self-sacrificing disposition, his willingness to subordinate his own material interests for those of others, recognized the underlying motive in all his actions: namely, to better pharmaceutical conditions in this country. His keen perception and analytical mind, especially in counsel, made him a safe guide in all things pertaining to the welfare of this Association and the profession of pharmacy in general. He will long be missed.

This Association and the pharmacists of America owe a debt of undying gratitude to his memory. His last words were: "The American Pharmaceutical Association. It was my life. It gave me a profession." The Bulletin of the A. Ph. A. of December, 1906, published his likeness and obituary. I recommend that they be incorporated in the next Proceedings.

I have named the following as a Committee on the Ebert Memorial Volume, and trust that it will meet with your approval: C. Lewis Diehl, Wm. Searby, S. A. D. Sheppard, H. M. Whelpley, C. A. Mayo, Jos. P. Remington, John F. Hancock, L. C. Hopp, J. H. Beal, Edward Kremers, C. S. N. Hallberg, and myself.

It has been the custom to mention something at this time regarding the place of meeting, the local secretary, also regarding the entertainments. This city, as a meeting place, with its many facilities, attractions and detractions, needs no further comment from me. The local secretary has shown by the admirable arrangements we find here that he is a past master in his line. As for the entertainment, I cannot speak at this time, excepting that we have had pleasant forebodings and anticipate pleasing things to come.

In conclusion I wish to state that the suggestions and recommendations presented are in a great measure the result of my personal observation and deductions, as they appealed to me from the standpoint of the pharmacist in actual practice. I deem these of vital importance and ask your careful consideration of the suggestions. It is my desire to present this in a direct and clear manner so there could not be any misunderstanding as to their meaning. It is my firm belief that the future is full of promise to pharmacy in this country, that the enactment of the Pure Food and Drugs Act is the silver lining now plainly visible on the dark clouds which have hovered over us these many years, that a new era is about to dawn, that it is for us to so guide and smooth the hard and billy roads that lead to success that we may again regain and hold that professional recognition which is our due.

I desire to gratefully acknowledge the kind services and willing aid rendered me by the officers and members of the Association. I also thank you for your patience and kindness and express the hope that you will not lay stress on my shortcomings in presiding over your deliberations.

I feel sure this meeting will be harmonious and productive of much good. Again, I thank you.

The address was greeted with prolonged applause.

The Chair called for action on the address of the President, and Mr. Jacob Diner moved that it be received and referred to a committee of three, to be appointed by the Chair for consideration and report at a later session. This motion was duly seconded and carried, and the Chair appointed as such committee Messrs. William H. Zottman, of Vermont; Ralph B. Gable, of New York; and Charles Holzhauer, of New Jersey.

President Eliel resumed the chair and called for the reading of the

minutes of the Council as the next order of business, and Mr. H. M. Whelpley, of St. Louis, Secretary of the Council, read in abstract the proceedings of the second session of that body held this (Monday) morning, September 2nd.

SECOND SESSION OF THE COUNCIL—HOTEL ASTOR, NEW YORK CITY, SEPTEMBER 2, 1907.

Council called to order at 9 a. m. by Chairman J. H. Beal, with the following members present: J. H. Beal, Chas. Caspari, Jr., Thomas P. Cook, Leo Eliel, Lewis C. Hopp, H. D. Kniseley, Jos. L. Lemberger, F. W. Meissner, Jos. P. Remington, A. M. Roehrig, S. A. D. Sheppard, H. M. Whelpley, M. I. Wilbert, C. S. N. Hallberg, Oscar Oldberg, G. H. Hitchcock.

Secretary H. M. Whelpley presented the following synopsis of the correspondence of the Council since the first session held at Indianapolis, September 7, 1906:

Council Letter No. 1—St. Louis, October 12, 1906.

The Council Committees for 1906-7 are announced by Chairman Beal as follows:

Membership—A. M. Roehrig (Chairman), Oscar Oldberg, Joseph P. Remington, F. W. Meissner, Edward Kremers, I. A. Keith, H. D. Kniseley.

Finance—Joseph L. Lemberger, Lewis C. Hopp, Chas. E. Dohme.

Publication—Charles Caspari, Jr., C. Lewis Diehl, Leo Eliel, H. M. Whelpley, C. S. N. Hallberg.

Centennial Fund—Leo Eliel, William McIntyre, Charles Caspari, Jr.

Auditing Committee—Joseph Helfman, William H. Burke, J. W. T. Knox.

Motion No. 1. It is moved by H. M. Whelpley, and seconded by S. A. D. Sheppard, that the sum of \$250.00 be appropriated for expense of "A. Ph. A. Bulletin." The salary of the editor is provided for by the action of the Association in 1905.

Motion carried.

Motion No. 2. It is moved by H. M. Whelpley, and seconded by A. M. Roehrig, that the local secretary, Thomas P. Cook, be made chairman of the local committee of arrangements, with authority to appoint his own associates on the committee.

Motion carried.

Motion No. 3. Proposes new members Nos. 1 to 13.

They were duly elected, with the exception of No. 7.

Council Letter No. 2—St. Louis, November 5, 1906.

Motion No. 4. It is moved by J. H. Beal, seconded by H. M. Whelpley, that Messrs. E. R. Squibb & Sons be given permission to publish an abstract of the National Formulary in connection with an abstract of the U. S. P., without charge, upon condition that there should be printed in some prominent place in the book a statement to the effect that permission to publish said abstract has been granted by the Council of the A. Ph. A.

In offering the above motion, the mover desired to say that, in his opinion, the publication of this and all other similar abstracts inure to the benefit of the Formulary and Pharmacopoeia, and to the profession of pharmacy and medicine, and that similar permission should be granted to all responsible persons, firms or associations, without cost.

Motion carried.

Chairman Beal furnishes the following letter for the information of the Council. He has appointed Messrs. Joseph P. Remington, Joseph L. Lemberger and C. Lewis Diehl as a special committee to consider and report to the Council on the subject brought to his attention by Dr. Samuel P. Sadtler in the following letter:

"Dr. James H. Beal, Chairman, Council A. Ph. A., Scio, Ohio—

Dear Dr. Beal: The recently enacted Pure Food and Drug Act is undoubtedly, as you

said in your paper presented to the Indianapolis meeting of the American Pharmaceutical Association, one of 'the most important and far-reaching examples of Federal legislation placed upon the statute books since the period immediately following the Civil War.' It is in connection with the bearings of this act that I am asked to write to you.

Messrs. Hance Brothers & White, of this city, have had, for forty years past, a trade-marked proprietary preparation known as 'Phenol Sodique.' In the 1888 issue of National Formulary, was introduced a preparation with the title 'Liquor Sodii Carbolatis,' or solution of sodium carbolate, and to this form of title was added, as a synonym, 'Phenol Sodique.' It is very obvious that the addition of this popular synonym was exactly analogous to the case of the preparation just preceding it, where Dobell's solution is given as a synonym. In other words, it is to call attention to the similarity of the National Formulary preparation to a proprietary compound already well known by name.

The two compounds are not identical, as can be readily verified by a simple inspection of the National Formulary preparation, made up according to the proportions and directions as there given, and the 'Phenol Sodique' of Hance Brothers & White, as found on the market.

Until the passage of the new Food and Drug Act, this made no particular difference, because the public was at liberty to buy the National Formulary preparation from any druggist, or to buy the specially advertised preparation of Hance Brothers & White, but since the passage of this act, under Section 7 of the Act it will be seen that the National Formulary, coming out in 1888 with the appropriation of this name as a synonym, has now been given the peculiar authority of establishing a standard for a much older and well known proprietary preparation, which, in fact, has always been distinctly different as a preparation, and only of analogous character.

Messrs. Hance Brothers & White, having consulted counsel, are desirous of having the matter adjusted quietly and amicably if possible, having the utmost friendly feeling for the American Pharmaceutical Association and the National Formulary published by it, and at the same time being desirous of continuing in the enjoyment of their rights as the proprietors of the older preparation.

Having been consulted in this matter, I have been asked to present it in a perfectly informal and friendly way to you, as the Chairman of the Council, and ask if this use of the copyrighted term 'Phenol Sodique,' in which Messrs. Hance Brothers & White had proprietary rights for nearly two decades prior to the issue of the National Formulary in 1888, cannot be withdrawn by formal action of the Council, so that it will no longer remain in the National Formulary when the law goes into effect January 1st next.

Of course, any one offering 'Liquor Sodii Carbolatis,' or solution of sodium carbolate, will be obliged to conform to the standard of the National Formulary under the law. The point made, however, in the case at hand, is that 'Phenol Sodique' is not identical with the Liquor Sodii Carbolatis of the National Formulary, and will be sold as a distinct preparation under the name of 'Phenol Sodique,' as it has been for forty years past. You can readily see that the inadvertent appropriation of this term, and its use as a synonym, has no standing in law, and trouble could arise under the new act if it continued in the book after the first of next January.

Will you kindly let me hear your views of the matter, and particularly as to whether you think the Council could be gotten to take formal action in sufficient time to remove these words from the National Formulary before the first of January next.

Awaiting the pleasure of an early reply, I remain,

Yours very truly,

SAMUEL P. SADTLER."

Motion No. 5. Proposes new members Nos. 7 and 14 to 23.

They were duly elected.

Council Letter No. 3—St. Louis, November 14, 1906.

Comments on motion No. 4:

Charles Caspari, Jr.: I desire to say that all parties desiring to use the N. F., in same manner or similar manner should be required to submit sample of the abstract before permission be granted for such use.

Joseph L. Lemberger: An abstract only as approved by the Council.

Edward Kremers: Should like to see page before voting.

Motion No. 6. It is moved by C. S. N. Hallberg and seconded by H. M. Whelpley that the request of the Chicago branch to donate National Formularies to the teachers of materia medica in six Chicago medical schools be granted.

Motion carried.

Motion No. 7. Proposes new members Nos. 24 to 29.

They were duly elected.

Council Letter No. 4—St. Louis, November 30, 1906.

Proposed amendment to the By-laws. At the request of the General Secretary I enclose a copy of the proposed amendment to the By-Laws which was referred to the Council for consideration and report at the next annual meeting.

Amend the By-Laws by changing the numbers of Chapters I, II, III, IV, V, VI, VII, VIII, IX and X to Chapters II, III, IV, V, VI, VII, VIII, IX, X, and XI respectively, and add another chapter to be known as Chapter I, as follows:

CHAPTER I.

OF THE ELECTION OF OFFICERS.

Article I. A nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

Article II. The Nominating Committee shall submit the names of three persons as candidates for each of the offices of President, First Vice-President, Second Vice-President, Third Vice-President, and three members of the Council. These names are to be submitted by the General Secretary by mail to every member of the Association, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after the adjournment of the annual meeting.

Article III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the *Bulletin* of the Association.

Article IV. The officers thus elected by a majority vote of the members of the Association shall be installed at the final general session of the next annual meeting.

Article V. The Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary shall be elected annually by the Council.

Motion No. 8. It is moved by H. M. Whelpley and seconded by S. A. D. Sheppard that the name of J. Winchell Forbes, Care Stein-Gray Drug Co., 230 East Fourth St., Cincinnati, O., be placed on the roll of members dating back to 1905.

Mr. Forbes was elected a member at the 1905 meeting but through an error on the part of the secretary of the committee on membership his name was omitted from the list of new members furnished the General Secretary.

Motion carried.

Motion No. 9. It is moved by H. M. Whelpley and seconded by William Mittelbach

that \$200.00 be appropriated to cover the expense of the Bulletin for the remainder of 1906.

Motion carried.

Motion No. 10. Chairman J. H. Beal requests your vote on the following request from J. D. Lippincott Company:

Below you will please find a sample of the proposed manner in which we desire to use the part of the text of the National Formulary in the U. S. Dispensatory. We understand that the parts of the text which you do not desire to be used are the working directions. The ingredients, quantities and dose would give the pharmacists and physicians sufficient information as to the general character of the preparation. We will insert in a prominent place on the copyright page a statement that the permission to use the National Formulary has been granted by the Council of the A. Ph. A.

Liquor ferri albuminati, N. F.: Solution of albuminate of iron. Fresh egg-albumen, liquid, 40 Gm. (580 grains); Solution of ferric oxychloride (N. F.), 200 Cc. ($6\frac{3}{8}$ fluidounces); Alcohol, 120 Cc. ($3\frac{3}{4}$ fluidounces); Aromatic elixir (U. S. P.), 400 Cc. ($12\frac{1}{2}$ fluidounces); Solution of sodium hydroxide (U. S. P.), distilled water, of each, a sufficient quantity, to make 1000 Cc. (32 fluidounces.)

4 Cc. (1 fluidrachm) of this solution contains about 0.026 Gm. ($\frac{1}{2}$ grain) of metallic iron in the form of albuminate.

Average dose, 8 Cc. (2 fluidrachms).

Motion No. 11. Proposes new members, 17 to 32.

They were duly elected.

Council Letter No. 5—St. Louis, December 19, 1906.

Permission to use part of the N. F. text (Motion No. 10). The Secretary of the Council was in error in making this a motion. Chairman Beal intended to have the request placed before the Council for comment, so that a motion would follow. The Secretary of the Council has received the following comments, but no one has volunteered a motion. Several of those making comments requested their expressions to be sent out before the result of a vote is announced.

J. H. Beal: Not submitted as a motion.

H. A. B. Dunning: Not as requested; might as well print the entire N. F.

Edward Kremers: This give-away is altogether too transparent.

A. M. Roehrig: Seems to me this sample gives about all of the Formulary.

S. A. D. Sheppard: This is not in accord with the previous action of the Council approved by the Association.

Leo Eliel: Contrary to various actions and views of the Council and Association. It would practically give this firm rights denied to others. If my recollection in the action in Council is correct (I was ill most of the time) a motion was carried that "same privileges granted to one firm be extended to any other of approved standing." We did grant E. R. Squibb & Sons privilege to "epitomise," and that is as far as we should go in this case. Any other course would be contrary to expressed opinion by vote of Association and Council. I hope it will not carry.

F. W. Meissner: The request seems to cover the full text of the N. F., with the exception of minor details of preparation or working formulas. Would feel more favorable to granting full use of text with working formulas in consideration of fair compensation for use of same, but not otherwise. It might, however, further the popularization of the N. F. if for a nominal sum the U. S. D. as well as other publishers be permitted to use the text in part.

William Mittelbach: The working directions of the N. F. should by all means go with the formulæ. Many druggists have only the Dispensatory from which to work or prepare these preparations, and to insure uniformity, the directions how to prepare them

should be with the formulæ wherever they appear, otherwise we will have these preparations discussed *secundum artem*, which means a great deal under the circumstances. Now that our pecuniary interests in the N. F. have been side-tracked, let us push the educational benefits to be derived therefrom.

C. Lewis Diehl: I would vote on motion No. 10, only with the distinct understanding that the text of the National Formulary, as modified by the proposition of the J. B. Lippincott Co., shall not follow the general text of the U. S. Dispensatory, either as a whole or in part, but shall be distributed throughout the main text, along with the U. S. P. preparations, under the class headings to which the preparations belong, for instance, vinegar under aceta, elixirs under elixiria, plasters under emplastra, syrups under syrupi, etc.

It would be a grave mistake if we were to permit the use of the N. F., as it has been in the past, in the form of an appendix to the main text, even though the formulas be given with the directions eliminated as submitted for approval.

I must, therefore, ask you to submit this communication to the Council before announcing the vote on motion 10, so that the members may have an opportunity to discuss the conditions proposed by me, and if desirable, qualify their vote in accordance with the views above expressed.

C. S. N. Hallberg: The specimen submitted by Lippincott & Co. is not within the scope and support of the resolution, nor as I believe, in accord with the wishes of the Association. The specimen submitted for liquor ferri albuminati is for all practical purposes a working formula.

Any pharmacist worthy of the name could make this preparation after this formula. It is not the dosage definition as appears in the second paragraph, which is all that the abstract of the N. F. should be; there are a number of articles numbered in the first paragraph which do not enter into the finished preparation, and whose employment is of absolutely no interest or importance to the physician or to the user of the preparation. I would say that only dosage definition should be permitted as illustrated in the second paragraph submitted. Exceptions to this only in the following instances:

First. In emulsions where it is desirable to present the entire formula for the quantity usually prescribed, say 100 Cc. to serve as a type of formulas for prescription writing.

Second. In some of the mixtures, notably those of copaiba and the mixtures, which should be presented in the ingredients and quantities of the usual quantity prescribed in the latter instances, 25 or 30 Cc.

Only where for a specific reason or where it is desired to present a complete picture of the finished preparation as suggested to the physician, should anything more than a dosage formula be given.

Chas. Caspari, Jr.: The form of abstract proposed for use in the United States Dispensatory is practically a working formula, and such a request appears to me as an insult to the intelligence of this body. Only in a few cases would further directions for manipulation be necessary, while in the majority of cases formulas like the one proposed would suffice to enable an intelligent pharmacist to make the preparation satisfactorily. At Indianapolis it was voted by the Association that no one should have the right to use the full text of the N. F., and the Council was given authority to decide upon subsequent individual applications. We have granted to E. R. Squibb & Sons permission to print abstracts of the formulas of the N. F., and the very utmost we can do now, it seems to me, is to grant the J. B. Lippincott Co. the same privilege, that is, to print the same kind of an abstract of the formulas. As some of the Council members may not be familiar with the abstracts as used by Squibb & Sons, I beg to submit the following specimens taken from their booklet:

Liquor ferri albuminati, N. F.: 1 fl. dr. contains about $\frac{2}{3}$ gr. metallic iron as albuminate. Mild chalybeate. Dose, 2 fl. drs. (8 Cc.).

Elixir ammonii valerianatis, N. F.: 2 grs. ammonium valerianate in 1 fl. dr. Nerve sedative. Dose, 1 fl. dr. (4 Cc.).

Syrupus bromidorum, N. F.: 1 fl. dr. contains 15 grs. of the mixed bromides of potassium, sodium, ammonium, calcium and lithium, with compound syrup sarsaparilla. Nerve sedative, antispasmodic. Dose, 1 fl. dr. (4 Cc.).

Unguentum resorcini compositum, N. F.: 6 per cent. each of resorcin, zinc oxide and bismuth subnitrate, 12 per cent. oil cade, with paraffin, petrolatum, hydrous woolfat. Antiseptic and astringent dermic.

Please compare the first of these specimen abstracts with the abstract proposed by the J. B. Lippincott Co.

At the eleventh session of the Indianapolis meeting, Prof. Remington, one of the editors of the "U. S. Dispensatory," himself submitted a resolution relative to the use of the N. F. text, which after some discussion was adopted. The last sentence of this resolution reads, "if permission be granted by the Council to one association, firm, corporation or individual, that the same privilege may be extended to any other of approved standing upon the same terms." Hence if we decide to allow the J. B. Lippincott Co. to publish the same abstracts of formulas as was allowed E. R. Squibb & Sons, we are complying with the resolutions adopted.

The question before us is one of considerable importance in regard to the future policy of the Council and Association, and I trust every member will give it careful thought before making a final decision.

Jos. P. Remington: As a member of your body it becomes my duty to place before you some considerations in connection with the vote on the application of the J. B. Lippincott Company for the permission to use part of the text of the National Formulary in the "United States Dispensatory."

I am aware of the fact that some of the members of this Council will be unable to eliminate from their minds the fact that I am one of the editors of the "United States Dispensatory," and to this extent interested in J. B. Lippincott's communication. This is a severe handicap to overcome, but I cannot feel satisfied in my mind that I should refrain from offering these views, for it is an exceedingly important matter, and the Council is entrusted with the responsibility of a decision which may have far-reaching results.

The Council has authorized a use of parts of the text of the National Formulary to journals and business firms; as far as I know publishers of commentaries have not as yet made application, with the exception of the one under consideration. Should there not be some discrimination made on the extent of the use of the text between a firm engaged in the manufacture of National Formulary preparations, and who do not desire to publish a list of the ingredients entering into them, and a firm who wishes to use part of the text in a book?

The only object that a book of reference can have is to give some information about a preparation. To be restricted to merely giving the titles and contents of a teaspoonful of a preparation must be to the readers of a commentary of little or no value, and to place in a conspicuous part of the preface or copyright page a notice that such permission to use the National Formulary by the American Pharmaceutical Association would be practically a farce.

J. D. Lippincott Company have offered to pay a reasonable sum for the use of the text, and would doubtless be willing to pay a proportionate sum for parts of the text. The proposition has been rejected by the previous Council.

That parts of the text can be used is demonstrated by the fact that parts are now actually in use with permission of the Council. A large sum of money has already been realized by the American Pharmaceutical Association from the sales of the book, which is now recognized by the Food and Drugs Act, and it is, therefore, in a sense, a public

book, as it forms part of a Federal law. It is placed by the law only second in importance to the United States Pharmacopœia; but there is a great difference. The United States Pharmacopœia has provided a fair and equitable plan by which its text can be used by publishers upon the condition that they pay for the privilege and print, in a conspicuous place in the book, that permission has been granted, and thus is the copyright protected.

Now, the only reason which has been advanced to account for the change in policy of the American Pharmaceutical Association is that the latter needs the money. That the American Pharmaceutical Association has the power to control the use will probably not be questioned by anyone; that it is wise and far-sighted to alter the policy so radically, involves a grave question. It puts the money-making question before the larger one of extending the usefulness of the book to the greatest number. With the large sales of the National Formulary assured, and money flowing in constantly, cannot the Council see its way clear to adopt a somewhat more liberal policy? For this would bear fruit ultimately in an increase in membership and influence.

The writer is not advocating a plan for obtaining any advantage over other commentaries and books, as all should be treated alike, and if the National Formulary is excluded from a commentary or book through the official act of the American Pharmaceutical Association, some explanation must be given for such action, for as said before, the National Formulary is now a public book. By withholding a working formula from a commentary the sales of the National Formulary by the Association will not be curtailed to any extent, and druggists can find some reason for the introduction of the National Formulary in a commentary if the ingredients as well as the titles are given.

In other words, will not the withholding of the working formula serve the purpose and meet the objection made to the use of the full text as in the last United States Dispensatory? Squibb's abstract gives the percentage of the ingredients and sometimes the quantities; in fact, there is not much uniformity in style or method. For illustration, "Pulvis Catechu Compositus," N. F., 40 per cent. catechu (gambir), 20 per cent. each kino and krameria and 10 per cent. each cinnamon and nutmeg. Again, E. R. Squibb & Sons, being manufacturers of National Formulary preparations, would desire to sell their own make naturally, and there would be no reason for printing the ingredients in the least. A commentary, on the other hand, would desire to give to its readers, who are pharmacists, the information as to the ingredients and quantities.

The reason for using the style shown by the sample submitted by J. B. Lippincott is that they would like to use the same style and size of type for the N. F. that is used for the U. S. P. preparations, inasmuch as both are official under the new Food and Drugs Act, and ought to be on the same plane. The preface to the new U. S. Dispensatory must give an explanation to its readers of the requirements of the Food and Drugs Act and its relations to the National Formulary, together with the reasons for not printing the full text of the Formulary.

The Food and Drugs Act will be on trial during the coming year. For the first time in this country, the United States Pharmacopœia is the legal authority for standards of official substances, and the National Formulary for unofficial preparations, and both will be subjected to a most rigid scrutiny and test. Why should one be published on a broad, liberal basis and the other on a restricted and narrow one? Can any argument be adduced for this condition other than the one which has been given—the need of the American Pharmaceutical Association for money?

Asking that each member of our Council may give this subject due consideration and with the trust that a more liberal spirit will prevail, this communication is respectfully submitted.

F. J. Wulling, Minneapolis, has been elected a member of the Council to represent the Northwestern Branch of the A. Ph. A. for three years.

W. B. Day, Chicago, Ill., has been elected a member of the Council to represent the Chicago Branch of the A. Ph. A. for a period of three years.

Otto F. Claus, St. Louis, has been elected a member of the Council to represent the St. Louis Branch for a period of three years.

Committee on Albert E. Ebert Resolutions: Chairman Beal announces the following special committee on Albert E. Ebert Resolutions: Leo Eliel (Chairman), South Bend, Ind.; C. S. N. Hallberg, Chicago; Lewis C. Hopp, Cleveland, O.

Motion No. 11. Chairman Beal received the following signed by Joseph P. Remington (Chairman), Joseph L. Lemberger and C. Lewis Diehl:

Upon receiving your letter of November 2d, I immediately communicated with Mr. Lemberger and Prof. Diehl. We have unanimously reached the conclusion that the words "Phenol Sodique" on page 98 of the National Formulary should be stricken out. Mr. Lemberger is further of the opinion that the names of preparations which are owned or controlled by certain firms, like milk of magnesia, should not be found in the Formulary. I will write to Professor Diehl and see if he agrees to this proposition, and I will then send you a report. It seems to me that there is no necessity whatever for the National Formulary to even seem to be encroaching upon so-called rights of firms and corporations. There is certainly a wide enough field for the book without such action.

In order to save time, I would move that the words "Phenol Sodique" on page 98 be deleted from the next issue of the National Formulary, so that it will not appear in the books issued on and after January 1, 1907.

The report was adopted.

Motion No. 12. It is moved by J. H. Beal and seconded by H. M. Whelpley that the editor of the Bulletin be instructed to publish a full-page half-tone of the late Albert E. Ebert as an insert to an early copy of the Bulletin.

Motion carried.

Motion No. 13. It is moved by J. H. Beal and seconded by H. M. Whelpley that the sum of \$10.00 be appropriated to pay for a floral piece at the Albert E. Ebert funeral.

Motion carried.

Motion No. 14. Proposal of new members. Nos. 33 to 40.

They were duly elected.

Council Letter No. 6.—St. Louis, January 10, 1907.

Unguentum Resorcini Compositum of the N. F. Chairman Beal has received the following communication and appointed a committee consisting of Lewis C. Diehl, Chairman, C. S. N. Hallberg and H. M. Whelpley, to consider the subject and report on the same to the Council.

The Independent Pharmaceutical Company and Unguentum Resorcini Compositum of the N. F.

For three years or more we have had on the market a product which we call Unguentum Resorcinol Compound, on which we have laid great stress, and explained its many virtues to a very considerable portion of the medical profession over the territory we cover. Our product, as you will see by circular inclosed, is slightly different from a formula which we note under practically the same caption in the National Formulary, Third Edition. We think an injustice will be done if it is necessary for us to change a name which we have used for the aforesaid period, more especially on account of the new Food and Drugs Act, which you can readily see will bring about various complications on and after the first of January, 1907.

Our formula originally contained Cocaine Hydrochlorate, but this was objected to by various practitioners for reasons which it is not necessary at this time to explain. We have found it advisable to leave this article out of our product and as you see we do not

have any bismuth incorporated, but on the contrary make use of acetanilid. Our proportions are very much different from the N. F. product and vary considerably in relation to color and the base used. We note that it will be rather difficult to make any change in the official title of the N. F. product at this time, but we trust it may be possible for your committee to make some ruling on this subject, and change the name of the N. F. Ointment in such a way that it does not conflict with a trade name we have made use of for years.

This product was given its present name more as an experiment than anything else. We desire to call it by a name, such as would be used by the average practitioner knowing the various ingredients, and a desire on our part to discontinue the use of special coined words, but we can readily see now where there is liable to be considerable confusion by adopting any such methods as we did in this instance, as it makes manufacturers spend their good time and money in building up a trade on a product of this nature, only to be liable to have it taken away by such a circumstance as has arisen.

We beg to thank you in advance for your kind attention to this matter at once, and trust that it may be possible to change the name of the product of the National Formulary so that it will not materially interfere with the marketing of ours, which is much older in term of years. Awaiting an early response, we are pleased to remain,

Yours truly,

INDEPENDENT PHARMACEUTICAL COMPANY,

Worcester, Mass., December 15, 1906."

Specimen abstracts of formulas of the N. F. proposed for the "Physicians' Manual of the U. S. P.," to be published by the American Medical Association:

1. Dosage formulas:

(a) Elixir cinchonæ et ferri. Bitter tonic, hematinic.

Dose—8 Cc., or 2 fl. drs., representing 0.25 Gm. (4 gr.), soluble ferric phosphate in elixir cinchona.

(b) Liquor ferri peptonati. Solution peptonate of iron. An agreeably flavored, non-styptic solution, representing about 0.65 per cent. metallic iron, masked in the form of peptonate; it contains about 20 per cent. (vol.) alcohol.

Uses—Hematinic; mildly chalybeate tonic.

Dose—8 Cc., or 2 fluidrachms.

(c) Pulvis potassii bromidi effervescens.

Uses—Antispasmodic, nerve sedative.

Dose—60 Gm., or 90 grains, a heaped teaspoonful, represents about 0.65 Gm. (10 grains) potassium bromide.

(d) Pilula aloini composita.

Aloinum, $\frac{1}{2}$ gr. (.03); resina podophyll., $\frac{1}{8}$ gr. (.008); ext. belladonnæ fol., $\frac{1}{4}$ gr. (.016).

2. Type formulas for certain classes of *extemporaneous* preparations.

(e) Emulsio olei morrhuæ, codliver oil, 50 in 100 Cc.

Olei morrhuæ, 50 Cc., or 12 fl. dr.

Acaciæ pulv., 12.5 Gm., or 3 drams.

Olei gaultheriæ, 0.4 Cc., or 6 minims.

Syrupi, 10 Cc., or 2 $\frac{1}{2}$ fl. drams.

Aquæ, q. s. ft. 100 Cc., or 25 fl. drs.

M. Et fiat emulsum secundum artem.

Dose—8 Cc., or 2 fluidrachms.

(f) Misturæ copaibæ, Lafayette.

Liq. potass. hydroxidi, 50 min. (3.2 Cc.).

Copaibæ, 3 fl. dr. (12.5 Cc.).

Tr. lavandulae comp., spirit aetheris nitrosi, ana 3 fl. dr. (12.5 Cc.).

Syrupi, 8 fl. dr. (30 Cc.).

Mucilaginis acaciae, 25 fl. dr. (100 Cc.).

One fluidrachm (4 Cc.) contains $7\frac{1}{2}$ minims, (0.5) copaibae.

Uses—Antigonorrhoeic, antiseptic, diuretic.

Dose—8 Cc., or 2 fluidrachms. "To be well shaken."

3. Percentage formulas:

(g) Liquor antisepticus alkalinus (Alkaline antiseptic): Aqueous solution, with 25 per cent. glycerin, containing potassium bicarbonate and sodium benzoate each 3.2, sodium borate 0.8, oil gaultheria 0.04, thymol, eucalyptol and oil peppermint, each 0.02 in 100 Cc., colored purple-red with tincture of cudbear.

To replace a well-known alkaline antiseptic solution of similar composition. Prescribed under its official name and dispensed in plain bottles (without the name blown in the glass). This article will not become known to the public as a cure-all.

Uses—Antiseptic, internally and externally, diluted with 4 to 5 times its volume with warm sterile water.

(h) Pulvis iodoformi compositus. Naphthalin—iodoform; mixture of iodoform 20, boric acid 30, naphthalene 50, oil of bergamot 2.5 parts.

Uses—Antiseptic.

(i) Unguentum resorcini compositum (Soothing ointment): Resorcinol 6, zinc oxide 6, bismuth subnitrate 6, oil cade 12, petrolatum, lanolin, to 100 parts.

Uses—Antiseptic, antipruritic, discutient. Similar in composition to several trade-articles, having the advantage of uniformity in composition and superior stability.

Motion No. 15. It is moved by C. S. N. Hallberg, that the use of the text of the National Formulary be limited to the dosage formulas, as stated in a, b, c, d, in the above draft; that exceptions be made as indicated under 2 and 3.

In commenting on above motion, Mr. Hallberg says, "I also would favor the suggestion of Professor Diehl that the formulas of the N. F. appear under their respective classes of official preparations and not alphabetically as a supplement or appendix."

Motion carried.

Motion No. 16. It is moved by S. A. D. Sheppard and seconded by H. M. Whelpley, that the General Secretary be instructed to devote a page in the 1906 volume of proceedings to each of the following organizations: The American Conference of Pharmaceutical Faculties, and the National Association of Boards of Pharmacy.

Motion carried.

Motion No. 17. It is moved by H. M. Whelpley and seconded by J. H. Beal, that the three-year term of members of the Council elected by local branches of the A. Ph. A. shall date from the last annual meeting of the A. Ph. A. held previous to the date of election of the new Council member by a local branch.

Motion carried.

Motion No. 18. Proposes new members Nos. 41 to 51.

Council Letter No. 7—St. Louis, January 29, 1907.

Dunning, H. A. B.: I approve of Hallberg's motion that the use of the N. F. text be limited to dosage formulas as stated in a, b, c, d, in draft by A. M. A. I do not think any exception should be made, not even as indicated by e, f, under type formula, etc., same draft, as the aim is not sufficiently important to compensate for complications that may arise. I believe it would be a better advertisement for the N. F. to appear as a supplement or appendix and would be more handy, provided abstracts are limited as above provided for.

Caspari, Chas., Jr.: I can see no good reason why it is desirable or necessary to

allow different abstracts of the text of the N. F. in the case of certain classes of extemporaneous preparations, as proposed by Prof. Hallberg. Emulsions and percentage formulas can just as well be stated on the dosage basis as other formulas, especially as regards the chief ingredients. I do not think the physician cares about the exact quantities of flavoring or similar agents. While it is true that the number of formulas to be abstracted in the more complete form (as shown under e, f, g, h, and i in Council Letter No. 6 may not be large, it seems to me that we should preserve something like uniformity in the matter of abstracts of the text to be allowed to publishers of other books. I feel satisfied that this would be perfectly satisfactory to the large majority of physicians. The abstracts proposed under a, b, c, and d are all right and all others should be made to conform to the same. Please consider me as offering the above comments in place of a direct vote on Motion No. 15 and publish same in next letter to the Council.

Diehl, C. Lewis: This motion is supplemented by the mover, Mr. Hallberg, by the comment, that he favors "the suggestion of Prof. Diehl that the formulas of the N. F. appear under their respective classes of official preparations and not alphabetically as a supplement or appendix."

If I am to understand that the passage of Motion No. 15 will carry with it this proviso, I shall be able to vote affirmatively.

I am decidedly of the opinion that if the formulas of the N. F. are distributed throughout the body of the text of Dispensatories and similar text-books as the U. S. P. formulas are now—for instance in the U. S. Dispensatory—but without the directions for manipulation, the interests of the association will be more effectually safeguarded than if we leave it optional with the publisher to print the N. F. as an appendix to the main text—as is now done in the U. S. Dispensatory—even though the use of the text be limited as proposed by Motion No. 15.

I may not be able to impress the importance of this view upon the members of the Council, but I cannot consent to give the concession contemplated by Motion No. 15 without this explanation and protest.

Meissner, F. W.: I vote "yes" on condition that use of the N. F. text be interdicted as per Professor C. Lewis Diehl's suggestion in Council letter No. 5, p. 11.

I am favorably impressed with the proposed abstract of the N. F. for the physician's manual of the U. S. P.

Mittelbach, Wm.: The use of the N. F. should not be limited in this case. The complete text would be better for all concerned.

Lemberger, Joseph L.: After considerable thought I believe this action will be more consistent and will not depreciate the N. F.

Phenol Sodique. Referring to the comment of M. I. Wilbert that the name "Phenol Sodique" has been used in France for a preparation similar to that found in the N. F., I have to say that I have been unable to find any authority for this statement. A solution of sodium carbolate is official in the Codex under the title "Phenol Sodé Dissous," and it is quite possible that the name "Phenol Sodique" is derived from that preparation, and that the proprietary article also corresponds to that in strength; but the preparation of the Codex contains only 7 per cent. of phenol, whereas the N. F. preparation corresponds to the "Liquor Natri Carbolici," formerly official in the G. P., and contains 50 per cent. of phenol.—C. Lewis Diehl.

A Defect in our Method of Voting. In our votes by correspondence we are usually confronted with the problem to pass upon motions which have not been properly discussed, or which we should like to amend, or upon which we may desire further information. Of course there are many motions of a routine character, such as admission of members and the like, that do not need discussion, but opportunity should be given to discuss, amend or substitute any important motion that may be offered by correspondence as is given by parliamentary usage at the meetings.

I therefore suggest that hereafter all important motions shall, after communication in a circular letter, lie over for at least one week, when they may be presented for vote, accompanied by the comments that members may make.

In this way it will become possible to amend an original motion, to offer a substitute, and in other ways to arrive at a more satisfactory and final vote.—C. Lewis Diehl.

Financial Status of the N. F. Chairman Beal submits the following:

In view of the numerous requests from the members of the Council which have come to me for information respecting the financial status of the National Formulary, I herewith submit a summary of information taken from a recent statement furnished by the General Secretary:

Total number of books printed to January 9 inclusive	14,000
Total number of books sold to January 9 inclusive.....	13,077
Copies on hand	923
Cash received from sales to January 9 inclusive.....	\$6,506 78
Cash due from dealers.....	1,453 28
Total.....	\$7,960 06
Cash paid for printing, binding, advertising and distributing Formularies to January 9	\$4,964 35
Expense for same unpaid	706 80
Total.....	\$5,671 15

The above figures show, therefore, an apparent net profit of \$2,288.91 at the time of making the above statement, and the Secretary had then on file unfilled orders for 1209 copies.

Dr. D. M. R. Culbreth, of Baltimore, Md., has been elected by the Baltimore Branch to represent the organization on the Council for a term of three years, dating from the Indianapolis meeting.

Motion No. 19. Charles Caspari, Jr., moves to reconsider the vote by which No. 15 was adopted, and that the following be substituted therefore:

"That the same form of Abstract allowed by the Council to E. R. Squibb & Sons be also granted to the American Medical Association."

Motion was lost.

Motion No. 20. Chairman Beal requests your vote on the adoption of the following report:

Your committee appointed to investigate the claim of the Independent Pharmaceutical Company, of Worcester, Mass., to a trademark right in the title "Unguentum Resorcinol Comp." on the ground of having used this title for the past three years or more for the exploitation of a product of their manufacture, have the honor to report that the results of their investigation clearly prove this claim to be invalid, if not preposterous, for the following reasons:

1. That in August, 1901, Mr. Louis Emanuel proposed a formula for a soothing ointment under the title "Ung. Resorcin. Co.," for the use of the committee on N. F., by whom it was reported to the Association in their report of that year (vide Proceedings A. Ph. A., Vol. 49 (1901) p. 196).

2. That in due course this formula was referred to the Chairman of the Sub-Committee on Construction of Formulas, Prof. W. L. Scoville, who, in 1903, reported the reconstructed formula under the name of "Soothing Ointment" to the Chairman of the Committee on N. F. as will appear by reference to the Proceedings of 1903 (vol. 51, p. 398).

3. That, therefore, the title "Ung. Resorcin. Co." was in use and published at least five years ago, and the formula, as it appears in the National Formulary III, has been public property over three years.

Your Committee do not concede that any injustice, real or implied, is done to the Independent Pharmaceutical Company, if the Council of this Association declines to direct any change, either in title or composition of Compound Resorcin Ointment as it now appears in the National Formulary, and so recommend. H. M. Whelpley, C. S. N. Hallberg, C. Lewis Diehl (Chairman), January 4, 1907.

Motion carried.

Motion No. 21. It is moved by C. S. N. Hallberg and seconded by H. M. Whelpley that the request of Dr. Frank Billings, Dean of the Rush Medical College, for one copy of the National Formulary to be contributed to the Rush Medical Library, be granted.

Motion carried.

Motion No. 22. It is moved by H. M. Whelpley, and seconded by Otto F. Claus, that the sum of \$300.00 be appropriated to cover the expense of the Bulletin for January, February and March, 1907.

Motion carried.

Motion No. 23. It is moved by J. P. Remington, seconded by M. I. Wilbert, that immediate steps be taken to advertise the National Formulary, by sending a suitable circular or postal card to every retail druggist in the United States, and that the Secretary of the Council be empowered to make contracts and have the advertisement mailed as soon as possible.

The Secretary of the Council takes it for granted that the reference to him in the above motion was unintentional. The General Secretary is Chairman of the Committee on Publication, which has in charge the publication, distribution and advertisement of the N. F.

Motion carried.

Motion No. 24. Proposes new members Nos. 47 to 65.
They were duly elected.

Council Letter No. 8—St. Louis, February 4, 1907.

"Dear Sir: Chairman J. H. Beal has just received and submits the following letter, and requests your vote on the proposition:

Motion No. 25. We believe you know that we have announced the date of issue of the new edition of the U. S. Dispensatory, and we are daily informing our customers of the time when they may expect supplies of the book. We understand from Prof. Remington, and also from your conversation with our Mr. Rawlings, that we cannot use the full text of the National Formulary. We feel that we should express to you our opinion that by the use of part of the Formulary, under permission of the Council, we will not be doing justice to the readers of the U. S. Dispensatory, to the American Pharmaceutical Association, nor to the Formulary itself.

Our opinion is so decided that we have concluded to submit to you, as Chairman of the Council of the A. Ph. A., the following proposition: We will pay the sum of \$500.00 upon condition that we are allowed to print in the 19th edition of the U. S. Dispensatory the full text of the last edition of the National Formulary without restrictions. We will insert on the reverse of the title page of the U. S. Dispensatory a formal acknowledgment that permission to use the text of the National Formulary has been granted by the American Pharmaceutical Association or the Council. We make this offer with the provision and upon the condition that the permission shall be granted within ten days from to-morrow, February 1st.

We shall greatly appreciate an immediate reply, and trusting that we shall receive the desired permission, we beg to remain,

Yours truly,

J. B. LIPPINCOTT Co."

January 31, 1907.

Motion lost.

Motion No. 26. It is moved by H. M. Whelpley, and seconded by C. S. N. Hallberg, that the American Medical Association be granted the privilege of using the portions of the text of the National Formulary as provided for in Motion No. 15 of Council Letter No. 6.

Motion carried.

Motion No. 27. Proposes new members Nos. 66 to 71.

Council Letter No. 9—St. Louis, February 13, 1907.

Comments on substitute for Motion No. 15. Motion No. 19.

Reid Hunt: Am sure present arrangements will be satisfactory and sufficient for the A. M. A.

Edward Kremers: Before voting, I would like to hear from both sides. Would like to see it referred to a committee of Beal, Caspari and Hallberg to report.

J. L. Lemberger: Am satisfied with disposition of motion 15.

Wm. Mittelbach: Am getting mixed up on this question.

Comments on N. F. for a Medical Library. Motion No. 21.

Edward Kremers: If a general motion were introduced I might gladly vote in the affirmative.

Ewen McIntyre: All libraries should have like donations.

Comments on advertising the N. F. Motion No. 23.

H. A. B. Dunning: I understand that such advertising has been done.

Leo Eliel: This would involve a great expense which I deem needless. The pharmaceutical journals reach all druggists and are the proper media, providing the Council deems it wise to advertise at all.

Edward Kremers: So long as we are not able to fill the orders, I fail to see why we should advertise.

Joseph L. Lemberger: Make it a postal card.

Ewen McIntyre: Yes, to General Secretary, Chairman Committee on Publication.

F. W. Meissner: As per understanding of Secretary of Council.

Wm. Mittelbach: Do not see the necessity. Pharmacists are being rapidly supplied with the N. F.

A. M. Roehrig: Appears to me the cost would be too great to warrant the expense. The journals are advertising the N. F. without charge.

S. A. D. Sheppard: Willing to leave the matter to those who have had more experience in advertising.

M. I. Wilbert: As modified by Secretary of Council.

Comments on use of N. F. Text. Motion No. 25.

W. B. Day: Would vote "yes" if publishers would intersperse formulas through U. S. D. and not print them as a supplement or appendix.

H. A. B. Dunning: Believe \$500.00 will be poor compensation for loss in future sales. The N. F. is now a recognized authority and will sell on its merits.

Leo Eliel: No right to consider this proposition. It is contrary to all previous wishes of Association and Council.

Edward Kremers: Will vote "yes" if I can be shown that it will be more profitable to grant the request than to refuse it.

J. L. Lemberger: After all previous action a money consideration can not be entertained. We are morally bound by our vote on motion 15.

Motion No. 28. Under date of February 4th, J. B. Lippincott Co. requests permission to use in the United States Dispensatory parts of the text of the National Formulary in the same way as granted to E. R. Squibb & Sons and the American Medical Association. J. H. Beal moves that the permission requested be granted.

Motion carried.

Motion No. 30. (Proposes new members.) Nos. 72 to 75.
They were duly elected.

Council Letter No 10—St. Louis, February 26, 1907.

Comments on J. B. Lippincott Co. and the N. F. Motion No. 28.

Wm. Mittlebach: The right thing to do now is to let all who will use the N. F. in full or abbreviated form. This is the proper way out of the difficulty.

Motion No. 31. It is moved by Thomas P. Cook and seconded by H. M. Whelpley, that the 1907 meeting of the A. Ph. A. be held the week beginning Monday, September 2.

Motion carried.

Motion No. 32. It is moved by Thomas P. Cook and seconded by H. M. Whelpley, that the headquarters of the 1907 meeting be at the Hotel Astor, Times Square.

Motion carried.

Thomas P. Cook: It is my opinion that more complete co-operation can be had from local people by holding the meeting in New York City. The Hotel Astor is well equipped for convention work. The entire tenth floor is given over to such purposes. The roof is fitted up as a summer garden, it being the largest and most beautiful in the world. There are many smaller hotels in the neighborhood and hundreds of restaurants. The location is at one of the subway stations and several surface lines pass the door.

Motion carried.

Motion No. 33. It is moved by J. H. Beal and seconded by H. M. Whelpley, that the St. Louis Druggists' Association be granted permission to publish an abstract of the National Formulary for the use of the St. Louis medical profession, said abstract to be similar to those authorized by the previous action of the Council and the Association.

Motion No. 34. Proposes new members, Nos. 76 to 92.

They were duly elected.

Council Letter No. 11—St. Louis, Mo., March 21, 1907.

Motion No. 35. C. S. N. Hallberg moves to reconsider motion No. 31, fixing the date for the first week beginning September 2d, and offers the following as a substitute motion: "That the annual meeting for 1907 be held during the week beginning August 19th."

Motion No. 36. It is moved by H. M. Whelpley, and seconded by Otto F. Claus, that Caswell A. Mayo be granted permission to organize a New York Branch of the A. Ph. A. in accord with the rules and regulations already adopted by the A. Ph. A.

Motion carried.

Motion No. 37. The undersigned move that the Publication Committee be authorized and instructed to publish a list of errors found, and corrections to be made, in the National Formulary III, for free distribution to purchasers of the book printed prior to February 1, 1907, who may apply for the same, that this list be printed in an early number of the "Bulletin." C. Lewis Diehl, Chas. Caspari, Jr.

Motion carried.

Motion No. 38. It is moved that all motions submitted to the Council for vote by correspondence, unless they be of an urgent character, or simply for the admission of applicants to membership, shall lay over for not less than one week from date of communication to the members.

If no comments or amendments or substitutes have been offered at the end of a week, a vote may be asked on the original motion.

If any such have been offered they shall be presented to the Council members for consideration. Thus an opportunity will be given to discuss, amend or substitute any

important motion that may be offered by correspondence as is given by parliamentary usage at the meetings. C. Lewis Diehl, S. A. D. Sheppard.

Motion carried.

Motion No. 39. C. S. N. Hallberg moves to reconsider motion 25, relating to advertising the National Formulary. Leo Eliel seconds the motion.

C. S. N. Hallberg: I offer the following reasons for moving a reconsideration of the appropriation passed recently for advertising the National Formulary:

1. It is believed there is no necessity for further advertising of the N. F. at this time.
2. All pharmacists know of it and know where they can get it.
3. The great expense of advertising it last year together with the sale of the book at such greatly reduced prices to wholesale dealers has left very little to the Association.
4. A much better plan and one which would cost practically nothing would be to circulate through the wholesale drug monthly circulars slips calling attention to the N. F.

If the motion to reconsider is carried, I would offer the motion that the General Secretary be requested to have 50,000 slips printed and apportion these through correspondence with local branches and officers of the Association among various wholesale drug houses to be enclosed with their monthly circulars.

Motion carried.

Motion No. 40. Proposes new members, Nos. 93 to 100.

They were duly elected.

Council Letter No. 12—St. Louis, April 19, 1907.

Date of 1907 meeting. Motion No. 35. This motion received but one half of one vote majority and is submitted again. See Motion No. 41.

Otto F. Claus: In my opinion, August 19 is more favorable date for physicians and professors of colleges of pharmacy to attend.

C. Lewis Diehl: Yes, if approved by Committee on Time and Place.

L. C. Hopp: At meeting of Northern Ohio Branch A. Ph. A., it was unanimously voted in favor of holding A. Ph. A. meeting, the week of August 19, and I was requested to vote for said date.

Motion No. 41. Date of meeting. It is moved by Leo Eliel and seconded by F. W. Meissner that the date for the 55th annual meeting of the A. Ph. A. be fixed as Monday, August 19.

Leo Eliel: In order to give the Local Committee in New York ample time to make the necessary arrangements, such as hotel and other reservations, also, in order to enable the various committees to make their arrangements properly, it is urged that all members of the Council vote promptly.

The reason for setting an earlier date than customary is that at this date the meeting would not interfere with attendance of those, who are at the usual date of meeting occupied with school matters, or have just taken their summer vacation. It would enable many of our members to attend who have to miss the meetings for these reasons.

Motion lost.

Motion No. 42. It is moved by H. M. Whelpley and seconded by Otto F. Claus that the sum of \$300.00 be appropriated to cover the expense of the A. Ph. A. Bulletin for April, May and June.

Motion carried.

Motion No. 43. Proposes new members, Nos. 40 & 101 to 120.

They were duly elected.

Council Letter No. 13—St. Louis, Mo., May 6, 1907.

Date of 1907 meeting (Motion No. 41).

Chairman Beal announces that since Motion 41 has failed to pass, Motion No. 31 of

Letter No. 10 remains in force, fixing date of 1907 meeting for the week beginning September 2.

Charles E. Dohme: I am decidedly for the date in September. I hope the Association will adopt a date in September for many reasons.

Edward Kremers: The wishes of the New York Committee should be respected. If an earlier meeting be desired in the future, the Association should issue definite instructions.

C. Lewis Diehl: Believe Mr. Cook has good reason for preferring September.

J. L. Lemberger: New York wants the Association in September. I vote in deference to them.

Motion No. 43. New members, Nos. 121 to 130.

They were duly elected.

Council Letter No. 14.—St. Louis, Mo., June 6, 1907.

Motion No. 44. Proposes new members, Nos. 131 to 172.

They were duly elected.

Council Letter No 15—St. Louis, June 27, 1907.

Motion No. 46. Moved by J. L. Lemberger, seconded by Charles E. Dohme, that inasmuch as the income, according to the statement of the Secretary and Treasurer, justifies the same, that the reduction made in the salaries of the officers since the action of the Association, affecting the years 1904-1905, 1905-1906, 1906-1907, be reimbursed, and the Budget for the coming year be reported to the Council for the previous prevailing amount of \$2,800.00 for salaries.

Motion carried.

Motion No. 47. It is moved by Charles Caspari, Jr., and seconded by S. A. D. Shepard, that an additional sum of fifty dollars be appropriated for account of printing and stationery for the current fiscal year. The appropriation made last summer covered \$300.00, whereas the annual expenses during the past three or four years have been \$340.00.

Motion carried.

Motion No. 48. Please vote on the following.

PROPOSED BUDGET OF APPROPRIATIONS FOR 1907-1908.

Salaries	\$2,800 00
Proceedings	3,500 00
Printing and Stationery	350 00
Miscellaneous Expenses, including Postage.....	200 00
Stenographers	300 00
Badges and Bars	90 00
Journals for Reporter	35 00
Committee on Membership	50 00
Traveling Expenses.....	200 00
Premium on Treasurer's Bond.....	12 50
Insurance	50 00
Certificates	15 00
Section on Scientific Papers.....	25 00
Section on Education and Legislation	25 00
Section on Commercial Interests.....	25 00
Section on Practical Pharmacy and Dispensing.....	25 00
Section on Historical Pharmacy	50 00
A. Ph. A. Bulletin	215 00

Motion carried.

Motion No. 49. Proposes new members Nos. 173 to 207.
They were duly elected.

REPORT OF COMMITTEE ON SCHEDULE.

To the Chairman of the Council A. Ph. A., and Members :

We, your committee appointed to draft a provisional schedule which shall hereafter serve as a guide to those having the program in charge, beg to submit for your consideration the schedule herewith, which, after considerable correspondence they believe will approximate to the wishes of the majority.

The instruction to avoid simultaneous sessions has been adhered to, but suggestions are included for such as deemed necessary. The letter of the Chairman to the members of the committee of section officers and others, who, he believed, would be interested, is also attached.

The report is made this early that it may be utilized should the Committee on Program desire to do so.

Respectfully,

E. G. EBERLE,
WM. MITTELBACH,
H. M. WHELPLEY,
CHARLES HOLZHAUER, *Committee.*

Schedule.

	10 a. m.	3 p. m.	8 p. m.
<i>Saturday prior to meeting :</i>			
Pharmaceutical Faculties			
Boards of Pharmacy.			
<i>Sunday.</i>			
<i>Monday:</i>			
General session and reception day.	General Session.	General Session.	Reception.
<i>Tuesday :</i>	1st Session.	2d Session.	3d Session.
Scientific Section day.			Lecture or Boards of Pharmacy and Teaching Faculties.
<i>Wednesday :</i>	1st Session.	2d Session.	
Educational and Legislative Section day.			Open for lecture or Board Pharmacy or extra session.
<i>Thursday :</i>	1st Session.	2d Session.	
Practical Pharmacy and Historical Section Day.			Historical Section.
<i>Friday :</i>	1st Session.	2d Session and Gen. Session.	General Session.
Commercial Section Day.			
<i>Saturday :</i>			
Entertainment Day.			Last General Session and Entertainment.

REMARKS.

In case a lecture has been provided for by the Scientific Section, this might be arranged for Tuesday night, the third session then being transferred to the time of the second session of another Section; likewise if it is deemed advisable to hold session of Boards and Faculties on Tuesday night so that any recommendations may be acted upon by the

Section on Education and Legislation, the latter arrangement would transfer the lecture to Wednesday night, etc.

DALLAS, TEXAS, *April 20, 1907.*

Dear Sir: Last year the American Pharmaceutical Association appointed a committee to prepare a permanent schedule whereby the business of the Association could be facilitated. The chairman now submits the following for discussion and awaits suggestions, which may be sent to him by mail, or, if preferred, through the "Bulletin" or other channel, the object being to arrange the work to the best advantage and convenience for the majority.

We must have *two* general sessions; we should have at least *three*. Each Section requires at least two sessions, the first one of each not to conflict with the first of any other Section. The Council will adopt its sessions without conflicting.

Could not the Boards of Pharmaceutical Examiners and Association of Faculties meet on the Saturday previous to the session, using such open time as will be hereafter indicated for further sessions, if necessary? The entertainment features should not conflict with the work. Pleasures provided for the ladies need not and should not interfere with the meetings. Members who desire to participate naturally follow their inclinations.

We have five Sections and the first day is given over to general session and reception, and there are six working days in the week, this seemingly presents the points to be provided for. Two suggestions for programs are herewith submitted; one is altogether in harmony with what the officers of the Section expect, but the arrangement may not suit. The other provides for simultaneous sessions of the Sections and permits of day entertainment or further sessions. In the first schedule we may designate: Monday, General Session and Reception Day; Tuesday, Practical Pharmacy Day; Wednesday, Scientific Section Day; Thursday, Education, Legislation and Historical Section Day; Friday, Commercial Section Day; Saturday, Entertainment Day. In order to cut short the session on Saturday, the last general session may be held Friday afternoon or night, that of Saturday being formal, so as to provide for an extra day or two on excursion tickets.

Schedule No. 1 appeals to the writer, first, because there is no conflict in Section work and secondly, because the work of each Section is completed with the day. Frequently, members interested in the work of one Section do not attend owing to time limitations, one session being held on the first day and the other on some day thereafter. Should it be deemed advisable to change so that the second session of two Sections be held at the same time, provision could be made for entertainment in the middle of the week, to which the writer, personally, is opposed, as the nights vacant for this purpose are deemed amply sufficient, with the last Saturday especially devoted to this feature.

Kindly arrange schedule in accordance with your views and mail to me at earliest convenience.

Sincerely yours,

C. G. EBERLE.

PROPOSED STATISTICAL SCHEME OF REVISION U. S. P.

To the Council of the A. Ph. A.:

In order that the necessary data may be secured concerning the drugs, chemicals and medicines used in prescriptions throughout the United States and its territories, the Council of the A. Ph. A., is asked to have printed for distribution with the consent and co-operation of the Committee on Revision of the U. S. P. and the Committee on Revision of the N. F., a pamphlet containing all the titles of those two works for the purpose of facilitating the enumeration from 1000 consecutive prescriptions.

The Chicago Branch desires about 100 copies of such pamphlet and suggests that 2000 copies to be printed for the use of the local branches and members of the American Pharmaceutical Association.

The above resolution was passed at the meeting of the Chicago Branch, Tuesday, May 28.

Fraternally,

W. B. DAY, *Secretary.*

New Member of the Council. The New York branch has elected G. H. Hitchcock, 1031 Sixth Ave., as a member of the Council, term expiring 1909.

Council Letter No. 16—St. Louis, July 15, 1907.

Motion No. 50. The Committee on Program, consisting of General Secretary Charles Caspari, Jr., Chairman, Local Secretary Thomas P. Cook and Secretary of the Council H. M. Whelpley, submit for vote the following:

PROPOSED PROGRAM FOR THE FIFTY-FIFTH ANNUAL MEETING.

Monday, September 2, 9 a. m., Council Meeting.

Monday, September 2, 3 p. m., First General Session.

Monday, September 2, 8 p. m., Reception.

Tuesday, September 3, 10 a. m., Second General Session.

Tuesday, September 3, 3 p. m., Section Practical Pharmacy and Dispensing.

Tuesday, September 3, 8 p. m., Section Practical Pharmacy and Dispensing.

Wednesday, September 4, 10 a. m., Section Education and Legislation.

Wednesday, September 4, 3 p. m., Section Education and Legislation.

Wednesday, September 4, 8 p. m., Joint Meeting of Faculties and Boards.

Thursday, September 5, 10 a. m., Section on Scientific Papers.

Thursday, September 5, 3 p. m., Section on Scientific Papers.

Thursday, September 5, 8 p. m., Section on Historical Pharmacy.

Friday, September 6, 10 a. m., Section on Commercial Interests.

Friday, September 6, 3 p. m., Section on Commercial Interests.

Friday, September 6, 8 p. m. Lecture under auspices of Scientific Section, or if such be not provided for, simultaneous session of other Sections may be held.

Saturday, September 7, 9:30 a. m., Final General Session.

Saturday, September 7, 3 p. m., Council Meeting.

Motion carried.

Motion No. 51. New members Nos. 208 to 236.

They were duly elected.

Council Letter No. 17—St. Louis, July 26, 1907.

H. M. Whelpley: The National Association of Boards of Pharmacy has called a meeting for August 31, 10 a. m. The American Conference of Faculties is not likely to have a meeting on August 31. General Secretary Caspari suggests the conference meeting for Wednesday evening and a joint meeting of the Faculties and Boards, Friday evening. The Scientific Section announces that no lecture will be given on Friday evening.

Motion No. 52. Proposes new members Nos. 237 to 244.

They were duly elected.

Council Letter No. 18—St. Louis, July 30, 1907.

Motion No. 53. At a meeting of the Committee of Arrangements for the coming convention of the American Pharmaceutical Association I was instructed to submit the following Program of Entertainment and move its adoption. It will not seriously interfere with the program of meetings of the various sections. It will only be necessary either to transpose Friday's or Saturday's business or to hold the afternoon session of the Commercial Section, either on the boat or on Saturday. If the scientific lecture is provided, it can be given Saturday, or some other time.

We have taken Wednesday night for the theater, because it is hardly worth while to deprive 400 to 450 people of pleasant entertainment because 40 to 50 members are attending a meeting of Faculties and Boards.

Every afternoon and evening, the Roof Garden of the Hotel Astor will be open to members, delegates and their families.

THOMAS P. COOK, *Local Secretary*.

PROGRAM.

Monday, 9 p. m., reception, supper and dance.

Tuesday, 10 a. m. to 4:30 p. m., automobile ride to Bronx Park, afternoon tea, 4:30 to 5:30 p. m., for ladies.

Wednesday evening, theater party for all.

Thursday, 4:30 to 5:30 p. m., afternoon tea for ladies.

Friday, 2 p. m., returning about 10:30 p. m., steamboat ride down harbor and shore, dinner at Coney Island, Luna Park and Dreamland.

Motion carried.

Motion No. 54. Proposes new members Nos. 245 and 246.

They were duly elected.

Council Letter No. 19—St. Louis, August 1, 1907.

Motion No. 55. General Secretary Caspari, Local Secretary Cook and Secretary of the Council Whelpley propose the following changes in program previously submitted in Council Letter No. 16:

Wednesday, September 4, 8 p. m., First Session of Section on Commercial Interests.

Wednesday, September 4, 8 p. m., Meeting of Conference of Pharmaceutical Faculties.

Thursday, September 5, 8 p. m., Second Session of Section on Commercial Interests.

Thursday, September 5, 8 p. m., Joint Meeting of Boards of Pharmacy and Conference of Pharmaceutical Faculties.

Friday, September 6, 10 a. m., Session of the Section on Historical Pharmacy.

Friday, September 6, 2 p. m., Steamboat Excursion to Coney Island, returning at 11 p. m.

Motion carried.

Motion No. 56. Proposes new members, Nos. 247 to 248.

They were duly elected.

Council Letter No. 20.—St. Louis, August 19, 1907.

Comments on Entertainment Program. Motion No. 53.

C. S. N. Hallberg: Contrary to resolutions.

M. I. Witbert: With the exception of the boat-ride on Friday, I have no serious objections to offer. This feature should either be transferred to Saturday or omitted altogether.

H. A. B. Dunning: Do not think that the session of Commercial Section should be interfered with, but that the boat-ride might be held on Saturday; otherwise, I believe the entertainment program will draw but few away from the sections.

Edward Kremers: Either the meeting of Faculties and Boards should be changed or the Wednesday co-entertainment. I don't care which.

Charles Caspari, Jr.: Provided the automobile ride and theater party are intended only for ladies; we cannot allow entertainments to interfere with business.

Otto F. Claus: The program on entertainment submitted by the local committee is a splendid one, does not interfere with the work of the Association and I hope the motion of Thomas P. Cook will pass.

Motion No. 57. The Committee on Publication respectfully submits the following schedule of prices of the National Formulary, to go into effect on September 2, 1907:

Plain Cloth Binding.....	\$1 50 per copy.
Cloth Interleaved	1 75 per copy.
Plain Sheep Binding	1 85 per copy.
Sheep Interleaved	2 00 per copy.

Discounts to dealers and others buying in like quantities to remain the same as heretofore.

These prices indicate an advance of 50c per copy and the committee feels justified in making the change since the National Formulary 3d edition has now been on the market fifteen months and everybody has had a chance to procure the book at the old price. There is no good reason why the Association should not now desire to reap a better profit on its labors and investments. If the schedule is approved by the Council immediate notice of the change will be sent to the pharmaceutical press and to dealers.

CHARLES CASPARI, JR., *Chairman.*

August 15, 1907. Motion, No. 58. Proposes new members, Nos. 249-264 inclusive. Final action on motion No. 57 was deferred until a future meeting.

On vote, motion No. 58 was adopted, electing applicants Nos. 249 to 264 inclusive.

On motion by Leo Eiel, seconded by A. M. Roehrig, the correspondence of the Council was approved.

H. P. Hynson reported verbally as Chairman of the Committee on Certificate for Colleges of Pharmacy Membership Prizes, and submitted a proposed form of certificate. The report was received.

It was discussed by S. A. D. Sheppard, M. I. Wilbert, Jos. L. Lemberger, H. M. Whelpley, Chas. Caspari, Jr., A. M. Roehrig, F. W. Meissner, J. P. Remington, H. D. Kniseley.

On motion by M. I. Wilbert, seconded by L. C. Hopp, the form of certificate was referred back to the committee for revision.

S. A. D. Sheppard offered the following:

Moved by S. A. D. Sheppard and seconded by H. M. Whelpley, that the Council recommend to the Association the following changes in the By-laws, viz.:

That Article I, Chapter VII, be so amended that the latter portion shall read as follows: Provided that any person whose name has been dropped from the roll of members for non-payment of dues may be readmitted after having again made application in regular form, the application being accompanied by the usual fee; or he may be readmitted, without such application, on payment of all back dues; in the latter case his membership shall date from the time when he first joined the Association, as previously printed in the Roll of Members, and notice of such action shall be inserted in the addendum to the Treasurer's report.

Carried.

Also that the latter part of Article II, Chapter VII, be amended by transposing the several sentences thereof and making said latter portion of Article II read as follows: Any newly-elected member, upon the payment of the annual dues for the year in which he is elected, shall be entitled to the annual volume of the Proceedings and all publications of the Association that are distributed to its members during the year. Any applications for membership made during the fiscal year viz., between July 1st of one year and July 1st of the following year shall be considered as of the current fiscal year; except that persons applying on or after March 1st shall not be *required* to pay the annual dues for that year, but if they do pay such dues they shall receive all the publications to which members are entitled for the year.

Carried.

On motion of S. A. D. Sheppard, seconded by A. M. Roehrig, it was decided to grant Sophus Joergensen a new certificate of membership without charge.

The Chair announced the following committee on credentials: Thos. Main, N. Y.; J. F. Patton, Pa.; J. A. Koch, Pa. Moved by Mr. Wilbert and seconded by Mr. McIntyre that the program stand as printed.

Discussed by Messrs. Kniseley, Caspari, Sheppard, Oldberg, McIntyre, Roehrig, Eliel, Remington.

Chas. Caspari, Jr., moved as a substitute that the program be modified by transposing the time set for meeting of the Section on Commercial Interests from Wednesday and Thursday at 8 p. m. to 10 a. m. and 3 p. m. on Thursday, simultaneously with the sessions of the Section on Scientific Papers.

A vote being taken the substitute motion prevailed.

Moved by Mr. Lemberger and seconded by Mr. Whelpley that the meeting of the Conference of Pharmaceutical Faculties be transferred from Wednesday to Tuesday evening.

Discussed by Messrs. Caspari, Whelpley, Eliel, Sheppard and Lemberger.

Motion carried.

On motion by Mr. Remington, seconded by Mr. Hallberg, the local secretary was requested to give publicity to the changes in program.

Upon motion by Mr. Roehrig, seconded by Mr. Whelpley, it was agreed to present to the person recommended by any school or college or board of pharmacy a certificate of membership in the A. Ph. A., after the said person shall have been elected to membership in the Association, a statement setting forth the reason for presenting the certificate to the person named to be inserted on the face of the certificate.

Mr. Halberg read the following

COMMUNICATION FROM THE EXECUTORS OF THE EBERT ESTATE.

"To the Council:

The executors of the estate of Albert E. Ebert beg to render the following information to the Council:

The late Albert E. Ebert, of Chicago, who died November 20, 1906, bequeathed all the residue of his estate (except \$100 willed to his foster-daughter Elsie) to the American Pharmaceutical Association to be added to the Ebert Fund, the whole amount to be held in trust by the Association on the same terms as on the original endowment of the Ebert Prize Fund of 1873.

The executors have disposed of the pharmacy and business at Nos. 7 and 9 East Polk St., together with the leasehold, and proprietary rights on certain medicines, under special limitations approved by the Chairman of the Council, the General Secretary and the President. The amount realized was \$3,500. There is remaining some jewelry, appraised at \$600. After the outstanding claims are all paid, provided the jewelry has realized the amount named, there should be left from \$1,500 to \$2,000. In addition to this there are two pieces of real estate, one situated in Winnetka valued at \$1,000, and two lots in Austin valued at \$1,500. These properties are increasing in value, and when sold added to the residue cash in bank, should net the Association at least \$4,000.

According to the statutes of Illinois the final account of the executors will not be made until one year after their appointment.

It is hoped that before the next annual meeting a complete account of the administration of the Ebert estate by the executors may be made.

Respectfully submitted,

CARL S. N. HALLBERG,

THOMAS N. JAMIESON,

Executors of the Albert E. Ebert Estate.

Chicago, August 30, 1907.

On motion of Mr. Sheppard it was ordered that the above communication be received

and spread upon our minutes and the thanks of the Council be extended to Messrs. C. S. N. Hallberg and T. N. Jamieson.

The following report was read and on motion referred for publication :

REPORT OF THE COMMITTEE ON PUBLICATION.

Mr. Chairman and Members of the Council of the American Pharmaceutical Association:

Your Committee on Publication beg leave to report that the Proceedings of the fifty-fourth annual meeting have been published and a copy of the same delivered in May of the present year and since that time to every member entitled thereto, according to the Treasurer's accounts, besides the usual number (about 100) of complimentary copies to the honorary members, state libraries, the pharmaceutical press, educational institutions and foreign scientific bodies. Of the total number of books (1950) printed, 200 copies remain on hand in flat sheets, 1700 having been bound in cloth and 50 in paper. It was also found necessary during the past year to bind in cloth 122 copies of the 1905 volume, 20 copies of the 1903 volume and 5 copies each of the 1895, 1898 and 1899 volumes of Proceedings, the stock having become exhausted and demand arising for the same. Owing to the fact that the bill for expressage and postage paid on the 1905 volume of Proceedings was not presented until after July 1, 1906, this item appears in our present account and adds very materially to the apparent cost of the book. The cost of publication and delivery for the year 1906-1907 is shown by the following items:

Composition, paper and press work (1950 copies).....	\$2,270 15	
Binding 1700 copies in cloth (1906) @ 23 cents.....	\$391 00	
“ 132 “ “ (1905) @ 23 cents.....	28 06	
“ 20 “ “ (1903) @ 23 cents.....	4 60	
“ 5 “ “ (1895) @ 23 cents.....	1 15	
“ 5 “ “ (1898) @ 24 cents.....	1 20	
“ 5 “ “ (1899) @ 23 cents.....	1 15	
		431 16
Expressage and Postage, 1905 Volume	428 65	
“ “ 1906 Volume	402 44	
Illustrations, including Special Appropriation	66 70	
Journals for Reporter (Foreign)	25 76	
Inserting 5 Sets of Plates.....	7 50	
Hauling, \$1.25; Telegrams, \$1.15	2 40	
Salary of the Stenographer	200 00	
Salary of the Reporter on the Progress of Pharmacy	675 00	
		<hr/> \$4,209 76

The volume of 1906 Proceedings is larger by 126 pages than the preceding volume, due to the presentation of a larger number of papers at the last meeting and the reinsertion of some matter previously omitted. It is very gratifying to be able to report that arrangements have been made whereby it will be possible hereafter to publish the Proceedings at a somewhat reduced cost and in a considerably shorter period of time. Barring unforeseen accidents and delays, it is hoped to be able to have the book in the hands of the members by February 1 at latest.

Your Committee is also much pleased to report that the demand for the new edition of the National Formulary exceeded its expectations and that it became necessary to print not less than 24,000 copies of the book during the past year. The demand seems to continue and there is every prospect of a financial success for the book. In February last it was found necessary to make certain corrections and changes in the plates which were furnished by the chairman of the National Formulary Committee and a four-page

circular of such corrections and changes was printed for the benefit of those who had purchased the book prior to March 1; a good supply of this circular was sent to dealers for distribution among their customers. The total expense to date of publishing the 3rd edition of the National Formulary amounts to \$7,129.93, to which must, however, be added the sum of \$689.08 spent for advertising the book in the spring of 1906. While a supplement to the National Formulary may be desirable within the next 2 or 3 years there does not seem to exist any necessity for another revision of the book until after the next revision of the U. S. Pharmacopœia. An account of the receipts from sales of the National Formulary will appear in the report of the general secretary.

For the Committee,

CHAS. CASPARI, JR.,

Baltimore, July 2, 1907.

Chairman.

The following was presented by Mr. Beal, seconded by Mr. Remington: There may be elected annually an Honorary President, whose duty it shall be to join with the President in signing certificates of membership in the Association, and to perform such additional duties as may be assigned to him by the Association or by the Council. Such Honorary President shall be nominated by the Council, and his election shall be by the Association at the same time as the election of other officers.

Carried.

The following report was submitted by the Chairman of the Council.

REPORT OF THE CHAIRMAN OF THE COUNCIL ON THE INVESTED FUNDS AND SAVINGS
ACCOUNTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, JULY 1, 1907.

Ebert Fund.

Balance on Deposit in Boston Penny Savings Bank	\$934 82
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Centennial Fund.

One Mass. State 3 per cent. Bond, No. 1705	\$1,000 00
Balance on Deposit Boston Penny Savings Bank	1,170 77
	<hr/> \$2,170 77

Life Membership Fund.

One Mass. State 3 per cent. Bond No. 1701	\$10,000 00
Three Mass. State 3 per cent. Bonds, Nos. 1702, 1703, 1704...	3,000 00
Balance on Deposit Boston Penny Savings Bank	2,290 46
	<hr/> \$15,290 46

Endowment Fund.

Balance on Deposit Boston Penny Savings Bank	208 20
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Total Invested Funds and Savings Accounts, July 1, 1907 . . .	\$18,604 25
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JAS. H. BEAL, *Chairman of the Council.*

JAMES SEYMOUR.

"State of Ohio }
County of Harrison } ss

Personally appeared before me, a Notary Public in and for said County and State, the undersigned J. H. Beal and James Seymour who being first duly sworn, depose and say that the above is a true statement of the Bonds and Savings Accounts of the American Pharmaceutical Association in the hands of the said J. H. Beal, all of which have by them been examined and checked by them this 6th day of July, 1907.

Sworn to before me and subscribed to in my presence this 6th day of July, 1907.

J. M. SPIKER, *Notary Public.*"

The report of the Auditing Committee was received and read, as follows :

REPORT OF THE AUDITING COMMITTEE.

To the Council of the American Pharmaceutical Association :

Gentlemen : The Committee appointed to audit the accounts of the Association have performed that duty, and beg leave to report that they have carefully examined the books of the Treasurer and General Secretary, as well as the vouchers accompanying the same, and find them correct.

The Committee finds that the Treasurer has received :

From Sale of National Formulary	\$10,728 75
“ Proceedings	176 61
“ Semi-Centennial Index	15 00
“ Badges and Bars	96 50
“ Certificates	150 00
“ Payment of Annual Dues	8,170 00
“ Interest on Ebert Fund	30 00
“ Interest on Bank Deposits	140 63
“ Life Membership Fees	100 00
“ Endowment Fund	207 00
	<hr/>
	\$19,814 49
On hand July 1, 1906	4,009 95
	<hr/>
Total	\$23,824 44
Disbursements	14,968 69
	<hr/>
Balance on hand June 30, 1907	\$8,855 75
Increase over balance on hand July 1, 1906	4,845 80

The Committee has also examined the sworn statement of the Chairman of the Council regarding the bonds owned by the Association and in his possession, as well as the bank books of the Association and the balances of the different funds. They were found to be correct and to correspond with the Treasurer's accounts.

The financial assets of the Association on July 1, 1907 were:

The Ebert Fund	\$934 82
The Centennial Fund	2,170 77
The Life Membership Fund	15,290 46
The Endowment Fund	208 20
The General Fund, as shown by balance of cash on hand	8,855 75
	<hr/>
	\$27,460 00
Value of funds as per report of last year	\$17,745 72
Cash balance July 1, 1906	4,009 95
	<hr/>
	21,755 67
	<hr/>
Net increase	\$5,704 33

JOSEPH HELFMAN,
JAMES W. T. KNOX.

Detroit, July 26, 1907.

The following was read and approved :

REPORT OF THE SECRETARY OF THE COUNCIL.

“ To the Chairman and Members of the Council :

Although the Council of 1905-6 held seven sessions at Indianapolis last year, the amount of business transacted by correspondence since that meeting has been much

larger than during any previous year. The Secretary of the Council has issued twenty Council letters, covering fifty closely typewritten pages, and conveying fifty-eight motions.

The Council has elected 264 new members and rejected one applicant for membership.

The local branches of the A. Ph. A. have added seven new members to the Council, which now has twenty-eight members, or four times the original number.

The minutes of the Council have been published in full in the "Bulletin" of the A. Ph. A.

Respectfully submitted,

HENRY M. WHELPLEY.

September 2, 1907."

On motion, applicants Nos. 265 to 320 inclusive were elected.

On motion, the Council adjourned until 9 a. m., September 3.

Mr. Anderson moved to approve the minutes of the Council as read, but accepted an amendment proposed by the General Secretary, that the minutes be approved as read, *except* that the action of the Council in changing the program so as to place the session of the Conference of Pharmaceutical Faculties on Tuesday night, simultaneously with the first session of the Section on Practical Pharmacy and Dispensing, instead of leaving it for Wednesday night as heretofore agreed and published, be not approved, and the motion was so put and carried.

According to custom, the General Secretary here called the list of Standing and Special Committees, in order that reports might be ready for presentation at to-morrow morning's session :

Committee on United States Pharmacopæia—A. B. Lyons, Chairman.

Committee on National and State Legislation—James H. Beal, Chairman.

Committee on Time and Place of Next Meeting—Frank Schachleiter, Chairman.

Committee on National Formulary—C. Lewis Diehl, Chairman.

Committee on Organization of Local Branches—C. S. N. Hallberg, Chairman.

Committee on Proposed Pharmaceutical Collection at Washington—Edward Kremers, Chairman.

Committee on William Procter, Jr., Monument Fund—J. F. Hancock, Chairman.

Committee on Publicity—E. H. Gane, Chairman.

Committee on Reorganization—C. S. N. Hallberg, Chairman.

General Committee on Membership and Reception—W. B. Day, Chairman.

Committee on Weights and Measures—W. M. Searby, Chairman.

Committee on Status of Pharmacists in Government Service—George Seabury, Chairman.

Delegates to American Medical Association—J. P. Remington, Chairman.

Delegates to National Association of Retail Druggists—William C. Anderson, Chairman.

Delegates to National Wholesale Druggists' Association—Joseph L. Iemberger, Chairman.

Mr. H. P. Hynson, of Baltimore, stated that news had been received of the serious illness of Mr. C. Lewis Diehl, Reporter on the Progress of Pharmacy, at the German Hospital in Philadelphia, and moved that the

Secretary be instructed to send a telegram of sympathy to Mr. Diehl in his affliction.

This motion was seconded by Mr. E. M. Boring, and was unanimously adopted.

Mr. S. A. D. Sheppard, of Boston, called attention to the fact that the Board of Trustees of the United States Pharmacopœial Convention, at a recent meeting, had received a report from the Chairman of the Committee of Revision on the subject of some recent changes and corrections in the United States Pharmacopœia, and stated that the Board of Trustees had preferred a request that this Association, on account of the great interest attaching to this report, should allow it to be read at one of its general sessions. Mr. Sheppard thereupon moved that this matter be made a special order for to-morrow morning's session after the regular order of business. This motion was seconded by Mr. Hancock and Mr. Anderson and carried.

The President here declared a recess of ten minutes according to the rule, to permit the members present to select their representatives upon the Nominating Committee to be formed at this time, each State and Territory being entitled to two members.

After the recess the General Secretary called the roll of the States, Territories and Provinces of Canada, and the Nominating Committee was made up as follows :

<i>Arkansas</i> —W. L. Dewoody, Frank Schach-leiter.	<i>Ohio</i> —Theodore Wetterstroem, W. T. Hankey.
<i>California</i> —R. G. Eccles, W. M. Searby.	<i>Oklahoma</i> —F. B. Lillie.
<i>District of Columbia</i> —Samuel L. Hilton, L. F. Kebler.	<i>Pennsylvania</i> —J. P. Remington, M. I. Wilbert.
<i>Georgia</i> —George F. Payne, J. V. LaGrange.	<i>South Dakota</i> —E. C. Bent.
<i>Illinois</i> —Fred C. Koch, C. S. N. Hallberg.	<i>Tennessee</i> —W. I. Gates, J. T. McGill.
<i>Indiana</i> —Frank H. Carter, O. C. Bastian.	<i>Texas</i> —M. Saccar, E. G. Eberle.
<i>Iowa</i> —Mrs. Fletcher Howard.	<i>Vermont</i> —W. R. Warner, W. H. Zottman.
<i>Kansas</i> —L. E. Sayre, F. E. Holliday.	<i>Virginia</i> —F. D. Nelligar.
<i>Louisiana</i> —Philip Asher, W. M. Levy.	<i>Washington</i> —C. W. Johnson.
<i>Maryland</i> —H. P. Hynson, J. F. Hancock.	<i>West Virginia</i> —Alfred Walker.
<i>Massachusetts</i> —J. W. Baird, J. G. Godding.	<i>Wisconsin</i> —Edward Williams, E. S. Heberd.
<i>Michigan</i> —A. B. Stevens, J. M. Francis.	<i>Indian Territory</i> —H. D. Kniseley.
<i>Minnesota</i> —Miss Josie Wanous, F. J. Wuling.	<i>Nova Scotia</i> —Frank C. Simpson.
<i>Mississippi</i> —O. W. Bethea.	<i>At Large</i> (appointed by the President)—I. L. Lemberger, Pennsylvania; J. G. Diaz, Havana, Cuba; A. M. Roehrig, U. S. Public Health and Marine Hospital Service; James H. Beal, Ohio; and H. M. Whelpley, Missouri.
<i>Missouri</i> —Chas. E. Caspari, Otto F. Claus.	
<i>Nebraska</i> —A. V. Pease.	
<i>New Jersey</i> —E. A. Sayre, J. C. Gallagher.	
<i>New York</i> —W. C. Anderson, J. Diner.	
<i>North Carolina</i> —E. V. Howell, E. V. Zoeller.	

There being no further business before the Association at this session,

the President declared the Convention adjourned to to-morrow (Tuesday) morning at ten o'clock sharp.

SECOND SESSION—TUESDAY MORNING, SEPTEMBER 3, 1907.

President Eliel called the Association to order at 10:25 o'clock, and called for the reading of the minutes of the first session. The General Secretary read the minutes of that session accordingly, and on motion of Mr. Asher the minutes were approved as read.

The President called for the report of the Committee on Nominations as the next order of business, and Secretary Whelpley, of the Committee, read the report as follows, the names of the various nominees being acclaimed as read:

REPORT OF THE NOMINATING COMMITTEE.

To the Officers and Members of the American Pharmaceutical Association:

The members met at 6 p. m., September 2d, organized, and unanimously nominated the following:

President—William Martin Searby, San Francisco, Calif.

First Vice-President—Oscar Oldberg, Chicago, Ill.

Second Vice-President—Henry Hurd Rusby, New York City.

Third Vice-President—Oscar Walter Bethea, Meridian, Miss.

Treasurer—Samuel Airus Darlington Sheppard, Boston, Mass.

General Secretary—Chas. Caspari, Jr., Baltimore, Md.

Reporter on Progress of Pharmacy—Conrad Lewis Diehl, Louisville, Ky.

Members of the Council—Leo Eliel, South Bend, Ind.; Eugene Gustavus Eberle, Dallas, Texas; Fabius Chapman Godbold, New Orleans, La.

Respectfully submitted,

J. P. REMINGTON, *Chairman*,
H. M. WHELPLEY, *Secretary*.

On motion of Mr. W. M. Levy, as amended by Mr. C. B. Lowe, Mr. Whelpley, Secretary of the Council, was directed to cast the affirmative ballot of the Association, first, for the nominee for President, as a special mark of respect, and then for the balance of the ticket as reported by the Nominating Committee. Mr. Whelpley carried out his instructions, announced that he had cast the ballot as directed, and the Chair declared these gentlemen duly elected officers of the Association for the ensuing year.

Mr. Whelpley, Secretary, read the minutes of the third session of the Council, held September 3, 1907.

THIRD SESSION OF THE COUNCIL—SEPTEMBER 3, 1907, 9:30 A. M.

Present: Messrs. Meissner, Sheppard, Whelpley, Oldberg, Roehrig, Lemberger, Caspari, Wilbert, Claus, Beal, Remington, Hallberg, Eliel, Kniseley.

The report of the Publication Committee on National Formulary and the amendment to the By-laws were made a special order of business for the next session.

The General Secretary, to whom was referred for investigation the matter of the present status of Lewis P. Ohliger, reported that full and satisfactory information had been

received through the aid of Prof. J. O. Schlotterbeck. He farther recommended that no action whatever be taken in the matter.

On motion by Mr. Whelpley, seconded by Mr. Roehrig, the recommendation was adopted.

On motion by Mr. Sheppard, seconded by Mr. Eliel, the following report was received and the recommendation adopted.

"To the Council:

The Committee on the Bulletin of the A. Ph. A. begs to submit the following report:

The Bulletin was issued every month since the last meeting maintaining the same size and style of last year. 3,000 were printed for each of the eleven months at a total expense of \$1,102.40, making the expense for each month average a trifle over \$100. This is exclusive of the honorarium paid the editor, but otherwise includes the total cost of the publication.

Of the Pre-Convention August Bulletin 40,000 were printed and all but about 300 were mailed, which were reserved for distribution at the meeting and for reserve. This large edition enabled us to send the Bulletin into nearly every drug-store in the United States. British North America was not included, because through a recent postoffice regulation, second-class postage does not apply outside of the territory of the United States and the expense of one cent for each Bulletin sent would have been prohibitive.

Of the 3,000 Bulletins printed every month about 600 have been sent to names of prospective members furnished by the Committee on Membership and the local branches, also to those in the service of the United States and to all members of the state pharmacy boards. 100 Bulletins are reserved from each issue.

The Committee recommends that an appropriation be made to cover the cost of the Bulletin for the entire year, say \$1,200, and that some provision be made for the extra expense of the Pre-Convention Bulletin for next year.

Respectfully submitted, H. P. HYNSON, Md.,
LEWIS C. HOPF, Ohio,
FREDERICK J. WULLING, Minn.,
H. M. WHELPLEY, Mo.,
C. S. N. HALLBERG, *Chairman*, Chicago."

Expenses of Bulletin.

3,000 September Bulletin, Vol. I, No. 9	\$101 16
3,000 October Bulletin, Vol. I, No. 10.....	93 72
3,000 November Bulletin, Vol. I, No. 11.....	107 87
3,000 December Bulletin, Vol. I, No. 12.....	100 29
3,000 January Bulletin, Vol. II, No. 1	109 60
3,000 February Bulletin, Vol. II, No. 2	104 90
3,000 March Bulletin, Vol. II, No. 3	93 17
3,000 April Bulletin, Vol. II, No. 4	102 99
3,000 May Bulletin, Vol. II, No. 5	93 61
3,000 June Bulletin, Vol. II, No. 6	105 40
3,000 July Bulletin, Vol. II, No. 7	89 69
Total	\$1102 40

Expenses of August Pre-Convention Bulletin, Vol. II, No. 8, 1907.

500 special letter-heads	\$4 00
Postage	5 00
40,000 envelopes and printing card	60 00
Addressing 40,000 envelopes.....	40 00
Expressage	1 25

Porterage	\$2 50
Ink	50
Postage, 1,200 one-cent for city and foreign.	12 00
Postoffice charge	42 01
Stenographer's salary	10 00
Regan Printing House, 40,000 Bulletins	510 00
Regan Printing House, list of names of subscribers.....	2 15
500 envelopes	2 50
Use of typewriting machine, 15 months	20 00
Total.....	<hr/> \$711 91

Contributions from Wholesalers and Manufacturers.

Fairchild Bros. & Foster, New York.....	\$50 00
Parke Davis & Co., Detroit.....	20 00
Mallinckrodt Chemical Works, St. Louis	20 00
Armour & Co., Chicago	20 00
Lehn & Fink, New York.....	20 00
H. K. Mulford Co., Philadelphia	20 00
Sharp & Dohme, Baltimore	20 00
Mellins' Food Company, Boston.....	20 00
Fuller & Fuller Co., Chicago.....	20 00
Schieffelin & Co.	20 00
Horlick's Malted Milk Co., Racine, Wis.....	20 00
Powers-Weightman-Rosengarten Co., Philadelphia.....	20 00
Merck & Co., New York.....	20 00
E. R. Squibb & Sons	20 00
The Wm. S. Merrell Chemical Co., Cincinnati, Ohio.....	20 00
Wm. R. Warner & Co., Philadelphia.....	20 00
Robert Shoemaker & Co., Philadelphia.....	10 00
Smith, Kline, French Co., Philadelphia.....	10 00
Muth Brothers & Co., Baltimore	10 00
Schlotterbeck & Foss Co., Portland, Me.....	10 00
Enno Sander Mineral Water Co., St. Louis.....	10 00
The Kauffman-Lattimer Co., Columbus, Ohio.....	10 00
Eastern Drug Co., Boston.....	10 00
E. L. Patch Company, Boston.....	10 00
The Hoffman-La Roche Chemical Works, New York.....	10 00
U. S. Pharmacopœial Convention.....	300 00
Total.....	<hr/> \$740 00
Expenses for Pre-convention "Bulletin".....	711 91
Balance to credit.....	<hr/> \$28 09

On motion by Mr. Whelpley, seconded by Mr. Sheppard, Mr. Philip Charles Candidus was nominated for the office of Honorary President.

On motion the Council adjourned.

Mr. Main, of New York, moved that the Association take a special vote upon the election of Mr. Philip Candidus, of Mobile, as Honorary President as a mark of respect to one of the Association's oldest members, and one who had been in attendance upon the meetings when-

ever in his power to do so. Mr. Whelpley seconded this motion, and stated that Mr. Candidus had just sent in the names of three applicants for membership from Mobile, stating in his letter of transmittal that he was unable to get away from his store long enough to secure many new members on account of having lost his clerk, and having had difficulty in replacing him, as he was *eighty-two* years of age. He desired to be remembered to the members of the Association present, and sent assurances that he would keep the Mobile membership up to the high-water mark.

Mr. Main's motion was then carried by unanimous rising vote. The Chair then put the vote on the adoption of the balance of the minutes as read, and it carried.

The Treasurer's Report was called for as the next order of business, and Mr. Sheppard presented his report as follows :

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, JULY 1, 1906, TO JULY 1, 1907.

RECEIPTS.

Cash on hand July 1, 1906	\$4,009 95	
Received from sale of 12 certificates @ \$7.50.....	90 00	
" " 12 certificates @ \$5.00.....	60 00	
" " Proceedings	176 61	
" " Badges and Bars.....	96 50	
" " National Formulary	10,728 ⁰ 75	
" " Semi-Centennial Index.....	15 00	
Received on account of Ebert Fund	30 00	
" Interest on Deposit in New England Trust Co., Boston.....	140 63	
" Annual Dues, 1898	\$5 00	
" " 1899	5 00	
" " 1900	5 00	
" " 1901	5 00	
" " 1902	10 00	
" " 1903	10 00	
" " 1904	135 00	
" " 1905	745 00	
" " 1906	4,715 00	
" " 1907	2,520 00	
" " 1908	15 00	
" from Life Membership Fees—		8,170 00
Frederick B. Kilmer	\$25 00	
Albert B. Lyons.....	25 00	
Louis Emanuel.....	25 00	
Azor Thurston	25 00	
		100 00
Received for Endowment Fund—		
John U. Lloyd	20 00	
Frederick B. Kilmer	25 00	
Albert B. Lyons.....	25 00	
Ewen McIntyre	25 00	

Chas. Caspari, Jr.....	\$25 00
Fred. Nitardy	5 00
John Coleman	5 00
J. D. August Hartz	15 00
Charles W. Snow.....	10 00
Stephen K. Sass.....	2 00
Marion A. Stout	5 00
Joseph F. Pearson.....	5 00
J. Newton Roe.....	25 00
Edward N. E. Klein	5 00
James H. Beal and S. A. D. Sheppard.....	10 00
	<hr/>
	\$207 00
Total.....	\$23,824 44

DISBURSEMENTS.

1906.			
August	1.	Check 1218. Wickersham Printing Co., Proceedings.....	\$346 68
	1.	Check 1219. Wickersham Printing Co., National Form- ulary	994 98
	1.	Check 1220. Wickersham Printing Co.— Proceedings	\$4 60
		Insurance	7 55
			<hr/>
			12 15
	1.	Check 1221. John S. Bridges & Co., National Formulary .	7 00
	1.	Check 1222. William Mittelbach, Committee on Member- ship	39 00
	1.	Check 1223. C. S. N. Hallberg, A. Ph. A. Bulletin.....	94 89
	1.	Check 1224. U. Holzer, Miscellaneous Expenses	2 90
	1.	Check 1225. Nixon-Jones Printing Co., Printing and Sta- tionery	16 30
	14.	Check 1226. John S. Bridges & Co., Printing and Sta- tionery	20 50
	14.	Check 1227. Thorp and Martin Co., Printing and Stationery.	15 00
	28.	Check 1228. William Mittelbach, Committee on Member- ship	11 00
	28.	Check 1229. Security Storage & Trust Co., Miscellaneous Expenses.....	10 00
	28.	Check 1230. Wickersham Printing Co.— Proceedings	\$11 50
		National Formulary	1209 07
			<hr/>
			1220 57
September	7.	Check 1231. H. A. Brown Dunning, Section on Practical Pharmacy	3 00
	7.	Check 1232. Wickersham Printing Co.— National Formulary	\$209 74
		Proceedings	48 14
			<hr/>
			257 88
	7.	Check 1233. J. W. England, Section on Education and Legislation	11 00
	7.	Check 1234. Charles Caspari, Jr.— Proceedings	\$7 37
		National Formulary	60 69

September	7.	Badges and Bars	\$ 80	
		Miscellaneous Expenses	70	
				\$69 56
October	2.	Check 1235. William Mittelbach, Committee on Membership	38 00	
	2.	Check 1236. Henry Briele, Badges and Bars	21 00	
	2.	Check 1237. C. S. N. Hallberg, Committee on Wm. Procter, Jr. Monument Fund	41 15	
	2.	Check 1238. Joseph B. Champion, Stenographer	31 70	
	2.	Check 1239. Charles Caspari, Jr., Traveling Expenses	61 97	
	2.	Check 1240. Edward Stern & Co., Committee on Wm. Procter Jr. Monument Fund	11 50	
	2.	Check 1241. H. E. Houck & Co., Section on Practical Pharmacy & Dispensing	32 66	
	2.	Check 1242. Harmegnies & Howell, Section on Education and Legislation	40 00	
	6.	Check 1243. E. J. Richardson & Sons, Insurance	27 50	
	6.	Check 1244. Wickersham Printing Co., National Formulary	257 00	
	9.	Check 1245. S. A. D. Sheppard, Traveling Expenses	83 10	
	9.	Check 1246. Henry P. Hynson.— Section on Commercial Interests	\$11 60	
		Miscellaneous Expenses	1 90	
				13 50
	9.	Check 1247. C. S. N. Hallberg, A. Ph. A. Bulletin	149 51	
	20.	Check 1248. C. S. N. Hallberg, 1st half-year's salary as Editor of Bulletin, 1905-1906	100 00	
	20.	Check 1249. Henry Briele, Badges and Bars	63 50	
	20.	Check 1250. John S. Bridges & Co., Printing and Stationery	8 25	
	20.	Check 1251. C. S. N. Hallberg, Committee on Wm. Procter Jr. Monument Fund	4 75	
	29.	Check 1252. Alpha. Photo-Engraving Co., Proceedings	25 90	
	29.	Check 1253. Security Storage & Trust Co., Miscellaneous Expenses	10 00	
	30.	Check 1254. J. G. McLean, Stenographer	200 00	
	30.	Check 1255. Nixon-Jones Printing Co., Printing and Stationery	17 40	
	30.	Check 1256. C. S. N. Hallberg, A. Ph. A. Bulletin	93 72	
November	15.	Check 2257. John S. Bridges & Co., Printing and Stationery	23 00	
	15.	Check 1258. Northwestern Branch, A. Ph. A., Committee on Membership	8 00	
	22.	Check 1259. C. H. Buck & Co., Printing and Stationery	49 50	
	22.	Check 1260. Wickersham Printing Co.— National Formulary	\$256 50	
		Miscellaneous Expenses	12 23	
				268 73
	22.	Check 1261. William Mittelbach, Committee on Membership	2 50	
	22.	Check 1262. C. S. N. Hallberg, A. Ph. A. Bulletin	107 87	
	26.	Check 1263. Wickersham Printing Co., National Formulary	722 28	

December	5.	Check 1264. Wickersham Printing Co.— National Formulary.....	\$119 20	
		Proceedings.....	11 50	\$130 70
	11.	Check 1265. Alpha Photo-Engraving Co., Proceedings...		6 30
	11.	Check 1266. Lambert-Deacon-Hull Printing Co., Section on Scientific Papers		10 00
	11.	Check 1267. C. Lewis Diehl, first half-year's Salary as Reporter on Progress of Pharmacy, 1906-1907. Less 10 per cent.....		337 50
	11.	Check 1268. S. A. D. Sheppard, first half-year's Salary as Treasurer, 1906-1907. Less 10 per cent.....		337 50
	11.	Check 1269. C. S. N. Hallberg, Editor A. Ph. A. Bulletin..		100 00
	11.	Check 1270. Henry M. Whelpley— First Half-year's Salary as Secretary of Council, and Committee on Membership, 1906-1907. Less 10 per cent.	\$135 00	
		Special appropriation for clerical expenses.....	37 50	172 50
	11.	Check 1271. Charles Sheppard Jr., first half-year's Salary as General Secretary, 1906-1907. Less 10 per cent.		450 00
1907.				
January	19.	Check 1272. The Wickersham Co., Miscellaneous Ex- penses		10 00
	19.	Check 1273. H. M. Whelpley, Miscellaneous Expenses...		7 70
	19.	Check 1274. J. O. Schlofferbeck, Illustrations for Proceed- ings.....		30 00
	19.	Check 1275. J. O. Schlofferbeck, Ebert Prize		30 00
	19.	Check 1276. John S. Bridges & Co.— Printing and Stationery	\$28 96	
		Section on Scientific Papers.....	4 75	
		Section on Historical Pharmacy	4 50	
		Section on Commercial Interests	5 50	
		Section on Practical Pharmacy and Dispensing ..	4 75	48 46
February	6.	Check 1277. William B. Day, Committee on Membership.		40 35
	6.	Check 1278. C. S. N. Hallberg, A. Ph. A. Bulletin.....		109 60
	6.	Check 1279. Nixon-Jones Printing Co., Committee on Membership.....		1 25
	6.	Check 1280. Philadelphia Branch of A. Ph. A., Committee on Membership.....		23 00
	6.	Check 1281. C. S. N. Hallberg, A. Ph. A. Bulletin.....		100 29
	9.	Check 1282. Wickersham Printing Co.— Miscellaneous Expenses.....	\$16 25	
		Proceedings.....	3 50	
		National Formulary.....	522 19	541 94
	9.	Check 1283. Grimm's Book Bindery, Section on Historical Pharmacy		25 00
	9.	Check 1284. Dennison Manufacturing Co., Miscellaneous Expenses		3 00
	23.	Check 1285. C. S. N. Hallberg, A. Ph. A. Bulletin.....		104 90

REPORT OF THE TREASURER.

51

February	23.	Check 1286. Nixon-Jones Printing Co., Printing and Stationery	\$12 55
March	2.	Check 1287. Nixon-Jones Printing Co., Printing and Stationery	1 75
	2.	Check 1288. Security Storage and Trust Co., Miscellaneous Expenses	10 00
	2.	Check 1289. S. A. D. Sheppard & Co.— Certificates	\$4 80
		Printing and Stationery.....	10 76
		Miscellaneous Expenses.....	18 82
			34 38
	8.	Check 1290. Thos. J. DeLashmutt, Manager, Premium on Treasurer's Bond.....	12 50
	13.	Check 1291. Alpha Photo-Engraving Co., Proceedings ...	4 50
	13.	Check 1292. Charles Caspari, Jr.— National Formulary	\$151 41
		Proceedings	9 87
		Journals for Reporter.....	25 76
		A. Ph. A. Bulletin	25
		Semi-Centennial Index.....	36
		Badges and Bars	1 90
		Miscellaneous Expenses.....	10 45
			200 00
	22.	Check 1293. William B. Day, Secretary Committee on Membership	18 00
	22.	Check 1294. John S. Bridges & Co., Printing and Stationery.	8 75
	22.	Check 1295. E. F. Kelly, Secretary-Treasurer, Committee on Membership	12 00
	25.	Check 1296. C. S. N. Hallberg, A. Ph. A. Bulletin	93 17
April	8.	Check 1297. Wickersham Printing Co.— National Formulary	\$485 44
		Proceedings	24 05
			509 49
	29.	Check 1298. John S. Bridges & Co., National Formulary..	35 00
	29.	Check 1299. Nixon-Jones Printing Co., Printing and Stationery	4 00
	29.	Check 1300. C. S. N. Hallberg, A. Ph. A. Bulletin	102 99
May	18.	Check 1301. Wickersham Printing Co., National Formulary.	720 98
	18.	Check 1302. John S. Bridges & Co., Printing and Stationery.	35 05
	18.	Check 1303. Security Storage & Trust Co., Miscellaneous Expenses	10 00
	18.	Check 1304. Wickersham Printing Co., Proceedings	2280 15
	28.	Check 1305. C. S. N. Hallberg, A. Ph. A. Bulletin	93 61
June	8.	Check 1306. Buck Printing Co., Printing and Stationery..	47 00
	8.	Check 1307. U. Holzer, Miscellaneous Expenses	7 35
	8.	Check 1308. C. Lewis Diehl, second half-year's salary as Reporter on Progress of Pharmacy, 1906-1907. Less 10 per cent.....	337 50
	8.	Check 1309. S. A. D. Sheppard, second half-year's salary Treasurer, 1906-1907. Less 10 per cent.....	337 50

June	8. Check 1310. Henry M. Whelpley— Second half-year's salary as Secretary of Council and of Committee on Membership, 1906– 1907. Less 10 per cent.	\$135 00	
	Clerical Expenses, Special Appropriation	37 50	
			\$172 50
	8. Check 1311. C. S. N. Hallberg, second half-year's salary as Editor of the Bulletin, 1905–1906.....	100 00	
	8. Check 1312. Charles Caspari, Jr., second half-year's salary as General Secretary, 1906–1907. Less 10 per cent.	450 00	
	18. Check 1313. E. F. Kelly, Secretary-Treasurer, Committee on Membership.....	11 00	
	18. Check 1314. John S. Bridges & Co., Printing and Sta- tionery	4 00	
	18. Check 1315. Wickersham Printing Co., National Formulary.	611 63	
	25. Check 1316. Nixon-Jones Printing Co., Printing and Sta- tionery	12 55	
	27. Check 1317. C. S. N. Hallberg, A. Ph. A. Bulletin.....	105 40	
			\$14,661 69
	Life Membership Fund	100 00	
	Endowment Fund.....	207 00	
			\$14,968 69

SUMMARY OF DISBURSEMENTS.

Proceedings	\$2,784 06
Stenographers	231 70
Journals for Reporter on Progress of Pharmacy.....	25 76
Salaries.....	2,520 00
Premium on Treasurer's Bond.....	12 50
Traveling Expenses.....	145 07
Section on Practical Pharmacy and Dispensing.	40 41
Section on Education and Legislation.....	51 00
Section on Commercial Interests.....	17 10
Section on Scientific Papers.....	14 75
Section on Historical Pharmacy	29 50
Committee on Membership	204 10
Committee on William Procter Jr., Monument Fund.....	57 40
Printing and Stationery	315 32
Insurance.....	35 05
Badges and Bars	87 20
Certificates	4 80
Ebert Prize	30 00
Miscellaneous Expenses	131 30
Life Membership Fund	100 00
Endowment Fund.....	207 00
National Formulary	6,363 11
Semi-Centennial Index.....	36
Office Expenses of Secretary of Council.....	75 00
A. Ph. A. Bulletin	1,456 20
Special Appropriation for Illustrations, 1906 Proceedings	30 00
Total amount of Disbursements.....	\$14,968 69
Cash on hand July 1, 1907	8,855 75
Total	\$23,824 44

APPROPRIATIONS AND EXPENDITURES UNDER THE SAME FOR THE FISCAL YEAR, JULY 1,
1906, TO JULY 1, 1907, TRANSFERS AS AUTHORIZED BY GENERAL RULE OF
FINANCE NO. 13 INCLUDED.

	Appropriations and Transfers.	Expenditures.
Salaries.....	\$2,520 00	\$2,520 00
Proceedings.	3,000 00	2,784 06
Printing and Stationery	315 32	315 32
Miscellaneous Expenses	200 00	131 30
Stenographers	300 00	231 70
Badges and Bars.	87 20	87 20
Journals for Reporter on Progress of Pharmacy.	35 00	25 76
Committee on Membership	386 40	204 10
Traveling Expenses	200 00	145 07
Premium on Treasurer's Bond.....	12 50	12 50
Insurance.	50 00	35 05
Certificates.	15 00	4 80
Section on Scientific Papers.....	25 00	14 75
Section on Education and Legislation.	51 00	51 00
Section on Commercial Interests	25 00	17 10
Section on Practical Pharmacy and Dispensing	50 00	40 41
Section on Historical Pharmacy	50 00	29 50
A. Ph. A. Bulletin.	1,500 00	1,456 20
Office Expenses of Secretary of Council.....	75 00	75 00
Special Appropriation for Committee on William Procter, Jr. Memorial Fund.....	100 00	57 40
Special Appropriation for Illustrations, 1906 Proceedings	30 00	30 00
Unexpended Balance.....		803 00
	<hr/>	<hr/>
	\$9,027 42	\$9,027 42

PROSPECTIVE ASSETS.

Not counting what is due from members whose names will probably be dropped from the roll this year, and also from members whose residence is unknown, there was outstanding on the books of the Association, July 1, 1907:

Annual Dues for 1906.	\$1,225 00
Annual Dues for 1907. ..	5,580 00
	<hr/>
	\$6,805 00

Respectfully submitted,

S. A. D. SHEPPARD.

ADDENDUM TO A. PH. A. TREASURER'S REPORT.

July 1, 1907.

This has been a prosperous year financially. The receipts for the fiscal year, not including money for Funds, were \$19,507.49. The expenses for the year were \$14,661.69. Thus the receipts exceeded the expenses by \$4,845.80.

If no advance dues had been paid in, previous to July 1, 1907, the cash on hand would have been \$6,320.75. This has been called the net cash balance, because such advance dues are to pay part of the expenses of the coming fiscal year.

The several funds, July 1, 1907, are as follows:

Ebert Fund	\$934 82, increased	\$6 86
Centennial Fund	2,170 77, increased	74 84
Life Membership Fund..	15,290 46, increased	568 63
Endowment Fund	208 20,	

Total value of abovenamed Funds, July 1, 1907. \$18,604 25.

The annual income from the Life Membership Fund has not been put into the treasury cash this year, because we did not need it. It will be noticed that this fund is now known by its old name and not by the name used in several recent years, the William Procter, Fund.

The Ebert Prize was given this year; therefore the amount of that fund is practically the same as last year.

The Endowment Fund established a year ago, with accrued interest, is \$208.20. The donors to it have been: Prof. John Uri Lloyd, Mr. Fred. B. Kilmer, Prof. Albert B. Lyons, Mr. Ewen McIntyre, Prof. Charles Caspari, Jr., Mr. Ferd. Nitardy, Mr. John Coleman, Mr. J. D. August Hartz, Mr. Charles W. Snow, Mr. Stephen K. Sass, Mr. Marion A. Stout, Mr. Joseph F. Pearson, Mr. J. Newton Roe, Mr. Edward N. E. Klein, also the founders. Prof. Lloyd and others have made subscriptions that extend over several years.

Mention should also be made of the fact that the Association has on deposit in the Boston Penny Savings Bank, Book No. 64,591, \$26.52 being money (\$25.00, with accrued interest thereon, placed in our hands in 1905 by Dr. Murray Galt Motter, of Washington D. C. In Dr. Motter's letter, when sending the money, he writes "Enclosed herewith please find my check for \$25.00 in payment of annual membership dues in the American Pharmaceutical Association for five years. Nominations for these memberships are to be made by the National College of Pharmacy as prizes offered, to the members of the classes of 1906, 1907, 1908, 1909, 1910, in accordance with the terms given on page 30 of the 34th Annual Circular of that institution.

This deposit, while in the care of the A. Ph. A. Treasurer, is known as the Motter Fund. As yet there has been no draft on this fund.

Letters received from many members during the year indicate that our Bulletin is doing good work, keeping the members in closer touch with the affairs of the Association and encouraging a more personal, wide-awake interest in all A. Ph. A. matters. The correspondence of this office is very large and there has, certainly, been less criticism than for many previous years, indicating a more intelligent and enthusiastic knowledge of the work and methods of the Association. This can have been gained in no other way than by reading the reports which are given to every member each month, through the pages of the Bulletin.

The receipts for the National Formulary were \$10,728.75. The expenses were \$6,363.11. Thus the receipts exceeded the expenses by \$4,365.64.

I most earnestly recommend that the price of the National Formulary be made at least \$1.50 instead of \$1.00 as at present. Perhaps the scale of discounts, allowed in its sale, should also be changed; but the fact I wish to emphasize is that the general net result to our treasury of the present price and discounts, is that we do not receive from the sale of the National Formulary the legitimate income that we should.

S. A. D. SHEPPARD, *Treasurer, A. Ph. A.*

After reading his report, Mr. Sheppard proceeded to make a strong plea for an endowment fund for the Association. He said that the American Pharmaceutical Association might be called the "Pharmaceutical University of the Western Hemisphere," and was the only place where a man could get a post-graduate course in pharmacy. It is the "Clearing-house for the colleges and for the Boards of Pharmacy" and needs, and should have, an endowment fund like the other great universities of the country—like Harvard, Yale, Princeton, Cornell and others. As the work of the Association grows, it will more and more need an endowment fund for its university work.

Mr. Sheppard, continuing, then spoke as follows :

Now, I want to ask the Association to allow me to make a personal statement. I shall not again be a candidate for Treasurer of this Association. The reason for this action is very simple: It is time for it. In my judgment the best interests of the Association could be advanced by having this work in the hands of a young man. The active work of the world is done by young men. It ought to be; it is right; it is the law of nature. Not that I am superannuated; I am not going to admit that. But I have been in harness for a long time. I joined the Association in 1865, forty-two years ago. In 1874, at the meeting in Louisville, I was elected Local Secretary, and served at the Boston meeting in 1875. That was the busiest, hardest work year I ever put in. In those days an exposition was one of the most important features of the meeting, and the Boston men were very ambitious to have an exhibition of drug merchandise, and we did. The estimated value of that exhibition was somewhere near \$300,000. In 1876, I was made First Vice-President at the meeting in Philadelphia. From 1876 to 1880, I was active in committee work. The Council was formed in 1880, and I was elected one of its first members, and was made Chairman of the Finance Committee. Prof. Remington was the first Chairman of the Council, and he well knows what peculiar and special conditions existed then, and later, which made the work of the Finance Committee in those years very strenuous. I was kept in the Council from 1880 to 1886, when I was made Treasurer. So that, when you shall meet next year, in 1908, at Hot Springs, I shall have been in practically continuous active service for thirty-four years, twenty-eight years in close touch with the finances of the Association, and twenty-two years as Treasurer. Certainly it is time for this action.

This notice is given now, a year in advance, so that there may be plenty of time for consideration in the selection of a new Treasurer. It is given at this session rather than later on, and at the time of the installation of officers, so that those who are at this meeting can talk it over among themselves. I spoke of the new Treasurer as a young man. The long-established custom of the Association in making several of its officers permanent ones, but guarded by annual elections, is very wise; so that if the right young man is elected Treasurer next year, the probability is that he will serve for quite a long term. But what is far more important is that the Association will have the benefit of his work during some of the best years of his life. Of course the Treasurer should be a man who has tact and patience, because when you touch a man's pocket-book you touch the man himself, and sometimes the real man is quite different from the man you meet as an ordinary acquaintance.

Another thought: It goes without saying that no one will be considered by anyone of us as the right man for this place unless we shall believe him to be an honest man and competent book-keeper, one who will pay close attention to details, and whose work will be approved by an auditing committee at the end of each year. There are hundreds of such young men among our members. But, gentlemen, that is not enough. Good, honest book-keeping is, of course, a necessity, but it is not the only important work of the Treasurer of this Association. He is brought into contact with our whole membership, in a way different from that of any other man, and unless he shall be a man who loves the Association, who loves its work, and who believes in the principles on which this great organization is founded, his work will not be of the best, for the very simple reason that he will not put himself into it.

Pardon me for speaking so long, and especially my presuming to suggest to you the type of man who, it seems to me, will best fill this place. I have done so only because I know, gentlemen, by long experience, how much influence every officer can have upon our work, and I do want to see the American Pharmaceutical Association go forward to larger, broader and better work each year as time goes by.

Gentlemen, I thank you for your attention. (Great applause.)

President Eliel said he hardly thought it necessary to say that the members of the Association must deeply regret Mr. Sheppard's announced intention to retire from office at the close of the term for which he has just been elected, but that his wishes should be respected. He commended his course in making known his determination at this time, so as to give the members ample opportunity to think about his successor, and choose the right man for this responsible place.

On motion of Mr. Thomas F. Main, seconded by Mr. Joseph L. Lemberger, the Report of the Treasurer was received and adopted.

The Report of the General Secretary was called for, and Mr. Caspari read his report in abstract, going into detail only as to the expense incurred in connection with the publication of the National Formulary. The full text of his report here follows :

REPORT OF THE FINANCIAL ACCOUNTS IN THE CARE OF THE GENERAL SECRETARY.

A. RECEIPTS AND EXPENDITURES ON ACCOUNT OF THE NATIONAL FORMULARY, FROM JULY 1, 1906 TO JUNE 30, 1907.

I. Receipts.

From Sales and Payment of Bills due July 1, 1906 \$10,728 75

II. Expenditures.

Composition and Electrotyping 271 pages @ \$1.98	\$536 58
51 Hours Alterations	25 50
6 Boxes for Plates @ 90 cts.....	5 40
Paper and Press Work, 24,000 copies @ 8.55 cts.....	2,052 00
Binding 16,315 copies cloth @ 11½ cts.	\$1,899 23
Binding 710 copies cloth int. @ 20½ cts.....	145 56
Binding 1,742 copies sheep @ 28½ cts.	496 48
Binding 1,033 copies sheep int. @ 37½ cts.....	370 38
	<hr/> 2,911 65
Expressage and Postage.....	892 15
231 Packing Boxes @ 25 cts.	57 75
3,007 Mailing Cases for Individual Books @ 1¼ cts.	37 59
Corrections made in Plates	35 57
14,000 4-page Circulars of Corrections and Changes.....	35 00
3,656 Metal Corners for 914 Books	9 14
Wrapping Paper, \$4.13; Strawboards, \$4.00; Twine, \$2.70	10 83
Copyright and Postage, \$1.31; Typewriting, \$2.35	3 66
Telegrams, \$1.76; Portorage, \$0.75; Hauling, \$0.35	2 86
	<hr/> 6,622 68

III. Remittances.

To Treasurer, as per Treasurer's Receipts..... 10,728 75

IV. Sales.

To Dealers and Individuals, as per Ledger Accounts 11,641 45

V. Accounts Unpaid.

By Dealers 912 70

VI. Bills Due by the Association.

For Expressage and Postage	\$136 23	
Binding 1,000 copies in cloth	115 00	
17 Packing Boxes @. 25 cts.	4 25	
		\$255 48

VII. Stock on Hand.

Copies in flat sheets (unbound)	3,869	
Copies bound in cloth	104	
Copies bound in cloth, interleaved	10	
Copies bound in sheep	14	
Copies bound in sheep, interleaved	3	
		4,000

B. SUMMARY OF TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF THE NATIONAL FORMULARY SINCE 1888.

Receipts to June 30, 1906 (see Proc., Vol. 54, p. 60)	\$14,091 56	
Receipts from July 1, 1906, to June 30, 1907.	10,728 75	
		\$24,820 31
Expenses to June 30, 1906 (see Proc., Vol. 54, p. 61)	\$9,042 23	
Expenses from July 1, 1906, to June 30, 1907	6,622 68	
		15,664 91
Total Receipts from Sale of Physicians' Epitome from June 1, 1900, to June 30, 1907		559 62
Total Expenses on Account of Physicians' Epitome from June 1, 1900, to June 30, 1907.....		649 45

C. SALE OF PROCEEDINGS.

Receipts from July 1, 1906, to June 30, 1907.....	176 61
Remitted to Treasurer, as per Treasurer's Receipts.....	176 61

D. TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF SEMI-CENTENNIAL INDEX.

Total Receipts from July 1, 1903, to June 30, 1906.....	\$2,253 47	
Receipts from July 1, 1906, to June 30, 1907.....	15 00	
		\$2,268 47
Total Expenses from July 1, 1903, to June 30, 1906.....	\$3,120 52	
Expenses from July 1, 1906, to June 30, 1907	72	
		3,121 24

E. ACCOUNT OF BADGES AND BARS.

Receipts from Sales of Badges and Bars from July 1, 1906, to June 30, 1907.	96 50	
Remitted to Treasurer, as per Treasurer's Receipts	96 50	
Stock on hand July 1, 1907	Gold Badges, 10; Gold Bars, 77	
Total Receipts from Sales of Badges and Bars to July 1, 1906 (see Proc., Vol. 54, p. 61).....	\$1,255 80	
Receipts from Sales from July 1, 1906, to June 30, 1907	96 50	
		1,352 30
Total Cost of Badges and Bars to July 1, 1906 (see Proc., Vol. 54, p. 61) ..		1,179 89
Cost of 26 Gold Badges	\$48 10	
Cost of 52 Gold Bars	36 40	
Registration Fees	2 08	
		86 58
		\$1,266 47

CHAS. CASPARI, JR., *General Secretary.**Baltimore, July 1, 1907.*

The General Secretary added that the books of the Secretary had been audited in connection with the books of the Treasurer.

On motion of Mr. O. F. Claus, the Report of the Secretary was adopted as read.

The President indicated the special order of the day, and called on Mr. Jos. P. Remington to present the special report made by him as Chairman of the Revision Committee of the United States Pharmacopœia to the Board of Trustees on the subject of changes and corrections in the Pharmacopœia. Mr. Remington then proceeded to read his report as follows :

THE RECENT CHANGES IN THE UNITED STATES PHARMACOPŒIA.

BY JOSEPH P. REMINGTON.

Public and professional interest in the U. S. Pharmacopœia is increasing rather than diminishing, and it is but natural that various plans for future revision should be discussed and every possible improvement should be adopted for the next revision in 1910.

Recently one of our prominent drug journals has opened its pages for a discussion upon the subject of "Government Revision." While the replies which have been sent to the journal have not been sufficient to warrant the expression of a definite opinion, it would seem that a majority of the writers are not favorable to a change in the general plan.

By a singular coincidence, the President of the British Pharmaceutical Conference, at the late annual meeting in Manchester, a man of approved judgment and ability, in his address, paid a tribute to American pharmacy and his approval of the Pharmacopœial plan in the following words: "You probably are aware that in the United States the Pharmacopœia is not the work of a medical council, but the legalized result of the co-operation of a large number of qualified medical men, professors, pharmacists and manufacturers. The passage of the National Food and Drugs Act last year in the United States made its Pharmacopœia (8th revision) the standard for official substances, and forced a compliance with its requirements, and, in consequence, many communications were received by the Committee of Revision of the U. S. Pharmacopœia, requesting modifications in the official text. The constitution and composition (personal) of the U. S. Pharmacopœia Committee is a model worthy of serious consideration by the British authorities. That is a committee thoroughly representative of all departments of practical pharmacy, galenical and non-galenical, including representative chemical manufacturers. It should be noted that the professional element is particularly strong and competent in the United States."

The United States Pharmacopœia (8th Rev.) received a larger number of favorable comments from European pharmaceutical writers than did any of its predecessors, and it is probable that the present Pharmacopœia has received on the whole a greater meed of approval from American writers than any previous one up to the time of the passage of the Food and Drugs Act.

The last two years have been times of stress and trial, and grave questions had to be met promptly and decisively, because the U. S. Pharmacopœia for the first time in its history became the standard of a wise and far-reaching law. The manufacturers of chemicals and pharmaceutical preparations, both wholesale and retail, and the importers and users of crude drugs became alarmed, and some panic-stricken, when they realized the scope and purpose of the new law. Firms which had been requested many times by the chairman and members of the committee to furnish information for the Pharmacopœia, which they alone, as large buyers or manufacturers could have to give, now came

forward in great haste, with requests, and in some cases demands, for modifications of the test.

This is not said in a spirit of complaint, for it is not to be supposed that any large number of business men would consent to give information to the committee who would make public the results of labors which had probably cost them hundreds of dollars. The Pharmacopœia of former days was regarded as a theoretical book, which was largely a nuisance. Every firm had its own processes and standards and methods of doing business, and so long as orders continued to come in for their goods and they could get satisfactory prices, what was the use of bothering about the Pharmacopœia? There was no legal way to compel them to follow a universal standard.

The results of this condition of affairs led to such unfairness in business methods that the honest manufacturer, who sought to make his products of the highest degree of purity, was greatly handicapped by a less-scrupulous firm putting upon the market a product less pure and frequently much less expensive to make. The majority of retail druggists throughout the country are influenced in buying goods to be used as medicines by the important consideration of cost. It may be said that for many years orders were sent to jobbers and wholesale druggists without any specification as to quality but with a very definitely-expressed idea as to price. The jobber, realizing that he had his living to make, bought his goods in the cheapest market. He knew that, except in a few cases, his customers would be dissatisfied if he sent the expensive goods, for in many cases it would be returned to him at his expense and the cheaper product forwarded. One of the greatest reliefs to the honest manufacturer of chemicals has been the enactment of the Food and Drugs Law, which compels the sale of chemical products at least of a grade corresponding with the minimum requirements of the purity rubric of the Pharmacopœia.

Never before in the history of these United States has there been such a peaceful revolution as that which followed the official adoption of the United States Pharmacopœia as the national standard. At first manufacturers were stunned and some dismayed because they feared financial loss from stock on hand and on the way to this country, but the retail druggist felt reasonably secure, because the national law could only be operative in interstate commerce, and the rules and regulations of the departments at Washington recognized a guaranty of the manufacturer and wholesaler, and this comparative indifference lasted until many States passed laws based mainly upon the provisions of the national law. Then the excitement became general, but as considerable time had elapsed since the passage of the Pure Food and Drugs Act, June 30, 1906, the strain was eased, and in the meantime meetings were held by various pharmaceutical bodies, able papers were written for the pharmaceutical journals, many journeys were made to Washington to consult with Dr. Wiley and the departments, and adjustments were made here and there, rules and regulations were revised, some decisions were reversed, new regulations were promulgated, and a spirit of forbearance, with patience and firmness, was wisely adopted.

In the meantime letters came pouring in to the Chairman of the Revision Committee asking that various changes be made in the standards. The Committee of Revision, after much debate, had adopted for the U. S. Pharmacopœia (8th Rev.), the purity rubric. By this is understood a clause in the text of the Pharmacopœia which limits the quantity of allowable innocuous impurities in chemicals, by stating in terms of percentage the amount of pure substance which must be present. It is, of course, taken for granted that everyone knows that the word "pure" must be taken relatively. The chemist who is working upon a determination of the atomic or molecular weight of a body must be certain the body itself is absolutely free from impurities, and years of labor are often spent by him in the development of methods and tests to prove absolutely that the substance is pure. The factors upon which depend the calculations for large operations

must be absolutely correct, and hence the degree of purity must be the very highest attainable by human effort. Such labor involves enormous expense, and when it comes to making chemicals for analytical work, photographic uses and special objects, the highest degree of purity attainable for the purpose must be secured; but chemicals used for medicinal purposes have a very different function—a physician desires to know exactly what he is using, but it does not make any practical difference to him whether ammonium bromide contains 97 per cent. of the pure salt or 97½ per cent. It would be impossible in ordinary practice to distinguish between the medicinal effects of 97½ per cent. and 100 per cent., for the difference in the dose would be imperceptible, but he does want to be assured that when he prescribes ammonium bromide he is getting a medicine that is not below the standard and which contains no noxious impurities.

In view of the events which have occurred since the first issue of the *Pharmacopœia* in July, 1905, notably the passage of the Food and Drugs Act, one can imagine the magnitude of the confusion and disturbance that would have occurred if no purity rubric existed and retail druggists were compelled by law to use medicinal chemicals of 100 per cent. purity; and occasionally one hears a writer, not sufficiently informed of the real conditions, demand an absolute degree of purity amounting to 100 per cent.; but care must be observed that the standards should not permit the presence of impurities which would be injurious, poisonous, or which would affect the proper medicinal action of the chemical.

By innocuous impurities are meant, by way of illustration, the presence of limited amounts of chlorides in the bromides, traces of sulphates and nitrates in the phosphates, etc., but in the latter, arsenic, of course, must be eliminated, as it is a dangerous impurity.

It became necessary to call a meeting of the chemical manufacturers and others whose business was seriously affected by the standards of the *Pharmacopœia*. In fact the United States government departments realized the importance of holding a conference with the manufacturers and importers, with the view of reconciling differences and smoothing out difficulties so as to reach practical results without endangering the underlying principles of the law. How this has been done is now a matter of history, and forms convincing proof that the regulations of the purity of foods and medicines have come to stay, and that the results which have already been accomplished in the improvement of foods and drugs has been worth to the country all the labor and expense which has been incurred.

The conferences that were held with the representative committees, from the chemical manufacturers and the National Wholesale Druggists' Association and others, were memorable occasions. A full hearing was granted—chairmen of the sub-committees, with members of the Committee of Revision were present at the meeting. The reports of the interested parties were considered in open session and afterward by correspondence laid before the whole Committee of Revision, votes were called for, and a list of additions and corrections was finally printed.

It may be interesting to present the following summary and analysis of the list of "Additions and Corrections." Those who have glanced at what appears to be a formidable list will realize that the changes which have been made, while important to the manufacturers, will have very little influence practically upon the efficiency of the chemicals as medicines. In other words, the medical profession will be served just as well by the latest issue as they were by the standards of the previous one.

The total number of changes of all kinds was 431, in a total of 1,297 articles, test solutions and assays, but of this number 431, 157 were changes made necessary through the adoption of one change in one part of the book which compelled a similar correction in other parts of the book; thus the assay committee, in order to satisfy a preference by a number of chemists for cochineal over hematoxylin, required a repetition of this correction 33 times; then again the few changes for standards for crude drugs,

ipecac, belladonna, stramonium, etc., caused corresponding changes in the tables in the appendix and elsewhere. There were 27 of these. A slight change in the bismuth standard necessitated a similar change in all the bismuth salts.

A further analysis reveals the fact that the physical constants which had to be changed, such as specific gravity, melting points, boiling points, saponification and iodine value, optical rotation, solubility, congealing point, ash and residue after incineration, amounted to 83. In nearly every case these changes were made to allow a wider range or to modify the severity of the test. A number of them were, of course, interdependent, a change in the specific gravity for the standard involving also a change in the boiling or melting point. A large proportion of the alterations in the standard for crude drugs involved corresponding changes in the preparations, and thus the list was swelled. It was found after conference with the chemical manufacturers that the "Heavy Metal Test," particularly in respect to the presence of traces of iron, was too stringent, and it was corrected. This involved 15 changes. The reasons presented by the chemical manufacturers were convincing; they stated that in making chemical salts in large quantities, often by the ton, the use of glass, porcelain or enameled vessels was out of the question, because of the inability to procure them in large sizes, and the loss and expense through breakage, and though the product was purified by re-crystallization, minute traces of iron which did not unfit the salt for medicinal purposes could not be separated without adding greatly to the cost. This concession need cause no alarm, since the present test permits the presence of only two one-hundredths of one per cent. of iron as an allowable impurity.

In every case where a concession was granted because of the extreme rigidity of the test, the sub-committee having charge made careful experiments, examining the salts made by different manufacturers before a decision was reached. In some cases it became necessary to add a word, delete another, to render the language of a test more definite or accurate; these did not make any difference in the standards, but the number of these amounted to 66. Twelve tests throughout the book were omitted because they were not conclusive or were more efficiently covered by another, or, for some other reason, were undesirable.

Thirty-three changes were made in chemical tests in which the word "absence" was replaced by the words "limit of," because it was not desirable to compel the salt to be absolutely free from the contaminating substance, and a detailed test was inserted which prescribed definitely the percentage of allowable impurities. Two changes were made for the better preservation of the official substance; two changes to fix the limit for the presence of arsenic. Nine changes were made to describe more accurately and less rigidly chemical substances. One new indicator (rosolic acid) was added to the list because it was preferred to phenolphthalein, and lithium sulphate was added to the table of molecular weights, because it was used in a gravimetric test. There were ten errors in 692 pages, typographical, editorial, or which could be laid to the door of the proof-reader. These last were all detected and corrected after the first issue from the plates so that they can only be found in the first printing of Series A, 2,000 Pharmacopoeias out of the total of 50,000.

None of these errors could be said to be vital, and not one of them dangerous to life, but such errors always cause annoyance and regret, and it seems impossible to evade the trite saying, "To err is human."

The Board of Trustees decided that inasmuch as the Pharmacopoeia had just been issued, and that prosecutions were likely to follow by the National Government, it was of the utmost importance that a departure be made from established precedent and that the additions and corrections should be given the widest publicity, and that the purchasers of a book of standards just issued, should have, practically without cost, the necessary data to make their book up to date. Those who did not care to correct their book have been

given the opportunity of purchasing another Pharmacopœia in which the corrections have been incorporated in the text of the book. This book is bound in a lighter shade of blue than the old issue, so that they can easily be distinguished when standing side by side upon a bookshelf. The sheep-bound copies have a red label on the outside to distinguish them from the old issue, which bear a dark-blue label.

The experience gained in the present revision will be of much value to the succeeding committee, and it is clear that some improvements may be made in the future which will facilitate the work. It is not likely that any future committees will have the difficulties nor pass through such strenuous times, and it is not necessary to enumerate in detail the causes of delay, but that the present method of revision by correspondence is cumbersome and some better means of communication between the members must be devised. The advantages of the present plan are; First, the committee is representative of various sections of the country; second, there has not been the slightest intimation from any quarter that the committee were influenced either directly or indirectly by pecuniary reward.

The writer knows of but one representative of a firm who believed that he could buy with money the insertion of a test which would make official his product and eliminate that of his competitors, and fortunately this representative of graft consulted with a manufacturer who knew the personnel of the committee and he was advised to go back home and not to make the attempt. He took the advice and the Committee on Revision were spared the temptation. Third, a Committee of Revision constituted like the present one is much nearer and closer to sources of information; and the education, training and life-work of such a committee fit them especially for the work.

If the present committee had been able to procure in 1902 and 1903 the information that was freely tendered by manufacturers and others in 1906, not only would there have been much time saved, but there would have been no necessity for sending out "Additions and Corrections." Fourth, it is significant that while some European nations are advocating a more popular and democratic method of revising their pharmacopœias, there is some talk in this country of changing the present method and placing the whole work in the hands of the Government.

This idea is not a new one, and it is probably brought forward at this time because the facts which are recited in this paper have not been sufficiently considered, but would it not be wiser to improve the present method as soon as it can be shown that this can be done, rather than to advocate an entirely new plan which would involve entirely new conditions and principles? As it is now, a committee free from bias, untrammelled by personal interests, working earnestly for the best results, can be secured. The main question upon which to base a proper judgment can be solved in the next two years when the Food and Drugs Act and the U. S. Pharmacopœia will be on trial and the difficulties met appropriately. The manufacturers and pharmacists as a rule are satisfied with the latest issue of the Pharmacopœia. They have incurred great expense to comply with its standard, and rapid and continuous changes in the standards are ill advised and have a tendency to disturb values and cause great losses. That the Pharmacopœia should be revised oftener than once in ten years must be apparent to all, and this subject must claim the serious attention of the next pharmacopœial convention, but, on the other hand, a constant tinkering with the standards should be avoided. That the medical profession will take vastly more interest in the revision of the next Pharmacopœia can be safely predicted; that for both medicine and pharmacy to work harmoniously together is also a necessity, and that any defects in the present plan of revision can and will be remedied in the future, is the sincere belief of the chairman of the Committee of Revision.

Mr. Joseph Feil, of Cleveland, stated that two very prominent manufac-

turing houses had lately advertised that, under the new regulations they had special permission for making tinctures and extracts in a manner somewhat different from that prescribed by the Pharmacopœia, and asked if such was the fact. Mr. Remington replied that there was nothing in the Pharmacopœia that gave special permission for such a thing, but he supposed the manufacturers in question were operating under that clause which permitted a manufacturer on a large scale to make preparations by a process different from that of the Pharmacopœia, provided the resulting preparations were identical with those of the Pharmacopœia.

On motion of Mr. Lowe, seconded by Mr. Searby, the report was ordered received and referred for publication, with the suggestion that it be published also in *The Bulletin* of the Association, for the purpose of giving it as wide publicity as possible.

The President announced the reports of standing committees as next in order, and, at the suggestion of Mr. Hallberg, the report of the Committee on the United States Pharmacopœia was first called for, and was read by Mr. E. F. Cook, a member of the committee, in the absence of Chairman Lyons :

REPORT OF COMMITTEE ON U. S. PHARMACOPEIA.

The year just closing has been for pharmacists one of readjustment, in view of the going into effect of the new Food and Drugs Act. Since the U. S. Pharmacopœia, under this act, was given authoritative force, it became necessary to review carefully its standards and requirements, to be sure that these were in no case too exacting.

Those who have followed the history of pharmacopœial evolution will remember that in former editions of our Pharmacopœia descriptions were given of numerous salts in a state practically of chemical purity. In the eighth revision the presence of a limited amount of such harmless "impurities" as are almost inevitably present in commercial products was distinctly permitted. This action was taken without any reference to the probability that the Pharmacopœia would hereafter be a legal authority on standards of purity. After the enactment of the new law it became apparent that in a few cases the purity requirements of the Pharmacopœia were still too exacting, particularly with regard to the exclusion of minute traces of sulphates and of iron.

Again, the eighth revision introduced for the first time tentatively standards of alkaloidal strength for a number of drugs and galenical preparations, supplying assay processes for the determination of that strength. The object in view was to insure reasonable uniformity in the medicinal activity of the drugs and preparations in question. It was not expected that results of very great precision would be reached by the assay methods prescribed, which were distinctly designated as "approximate." It has been stated by some that these methods are generally unworkable and are not a credit to the revisers of the Pharmacopœia. As a matter of fact the methods are generally sound in principle, and only in a few instances needed modification in some details to make them practical. To one accustomed to assay work, the defects would become at once apparent and would be easily enough avoided. However, modification of the details in several of the assay processes, removing the difficulties of which complaint was made, was an obvious requirement when the Pharmacopœia became a legal authority.

The more serious complaint was made that alkaloidal standards had been set so high that in many cases the average drug of the market would be condemned or else barely

come up to requirements. It is true that the standards were those that had been in use already for years by manufacturing firms, voluntarily adopted by them. Nevertheless they proved to be in many instances a little higher than the average articles on the market. Whether a Food and Drugs Act had been enacted or not, it is likely that in the next revision of the Pharmacopœia the standards would have been modified in the light of a larger experience. As it was, simple justice to the rank and file of pharmacists demanded that, under the operation of the new law, the standards should not be unreasonably high.

I might go on and give specific reasons why it was necessary to make numerous "corrections" in the Pharmacopœia before it should become the basis for legal proceedings under the new law. I think that it was inevitable that it should be so. Of course a list of more than two hundred changes looks ugly, and the Revision Committee will be charged with gross carelessness or incompetence or both. I venture to say, however, that no body of men, large or small, could have carried out an undertaking of such magnitude without leaving their work open to equally harsh criticism under the circumstances, viz., of having the book put to an unforeseen use.

Clearly changes were needed in the text of the revised Pharmacopœia. The question will arise: What authority has the Revision Committee to make such changes after the Pharmacopœia has been once published and declared "official?" The committee was authorized by the Convention to issue supplements to the Pharmacopœia as they might deem necessary. This would seem to be sufficient authorization, and yet it would seem best to offer the new matter as a "supplement" and to add a paragraph declaring that after a certain date the new standards and methods should replace the old as official. At present there is nothing to indicate that the emendations that have been printed and distributed have an official character. Law is unreasonably exacting in such matters. I am informed that some cases of prosecution under the new law have already fallen to the ground because, forsooth, it could not be shown that the Pharmacopœia cited was a "certified copy!" What, pray, does the statement "official copy," which appears in each volume, mean, to a lawyer? (I would like to write a book on legal versus common-sense logic!)

A few of the changes that have been made are open to criticism. They seem to have been too hastily adopted.

In the case of liquor ferri chloridi and liquor ferri tersulphatis, solutions of a definite strength, much too large a range of specific gravity is permitted.

Bismuth citrate, also bismuth and ammonium citrate are to be ignited before applying the test for arsenic. It seems hardly possible that ignition of an organic salt would fail to reduce at least a portion of the arsenic to the "metallic" state, when it would surely be volatilized. The tests, in this respect, remain unchanged, as in the case also of bismuth subgallate. Since the modified Gutzeit test has been adopted very generally for other compounds, why should it not have been prescribed, with suitable modifications, in the case of salts of bismuth?

The test for arsenic in tartar emetic has been made extraordinarily liberal, permitting the presence of nearly 0.1 per cent. This must be because the commercial salt may be expected to show much more than a trace of arsenic.

In a number of instances the changes that have been made are not as radical as would be desirable. For example, the test for tartaric or oxalic acid in citric acid, which may prove "misleading," is simply omitted, although one would say that tartaric acid would be the most frequent adulterant of citric acid. The committee wisely refrained from making any changes not absolutely necessary to prevent injustice in the carrying-out of the present law.

The suggestion has been recently made that the Pharmacopœia as an authoritative standard ought to emanate in some way from the general government. No really

weighty reasons have been given for such a radical change. The working plan proposed, indeed, does not greatly differ from that which has been evolved, as it were, spontaneously. The government as such has no knowledge of the *Materia Medica*. The medical profession alone decide what articles they will prescribe as remedies for disease. A "government" might declare that no poisons, like arsenic or strychnine, no narcotics like opium or chloral should be used in medicine. Instead, in free America, the government recognizes the right of the medical profession to employ whatever remedy, innocent or heroic, it may find serviceable for the alleviation of suffering or the cure of disease. If it is the physician who is to be the chooser of remedies, it is the pharmacist who must have the practical knowledge of the chemical and physical properties of those remedies, and so the *Materia Medica* must be created by physician and pharmacist working in conjunction. It is from them and from them alone that the "government" can get the information necessary for the fixing of standards. All this is axiomatically true. Those who say that they wish to have government originate the Pharmacopœia can mean only that the government, after consulting the medical and pharmaceutical professions, should put the stamp of their authority on the compilation of remedies and standards which constitutes the Pharmacopœia. But that it has already done in the Food and Drugs Act. In addition, it is expected that the government will also publish the book of standards, and sell it at cost price, but is it customary for governments to issue at cost price volumes of other statutory matter?

On the other hand, we have now a system tested through many decades, whereby the ever-changing practice of physicians in the choice of remedies is given concrete form in a national Pharmacopœia.

The system may be improved, as it has been continuously improved from decade to decade. Now that the government has a drug laboratory, it will be the natural thing that this laboratory have a representative on the Revision Committee. Manufacturing firms *as such* should not be so represented, but the competent men connected with such firms will always find their services in demand as members of the Committee, if they can afford to sacrifice the amount of time that will be required. Heretofore these men have been very bashful about offering suggestions to members of the Committee, even when such suggestions have been solicited from them. Now that the Pharmacopœia has become a legal book of standards, we may be sure that there will be no such backwardness.

This is a mere apology for a report of your Committee. It has not been possible during the past year to carry out any plan for concerted work in the Committee, owing to the pressure of work that re-adjustment to new conditions has imposed upon the chairman and most of his colleagues. We hope that another year will give us breathing time enough to organize ourselves for effective work.

Respectively submitted for the Committee on U. S. Pharmacopœia.

A. B. LYONS, *Chairman*.

On motion of Mr. Asher, of New Orleans, the report was received and ordered referred for publication.

The Report of the Committee on Time and Place was called for, but the Chairman of that committee was not yet ready to report.

The Report of the Committee on National and State Legislation was also called for, but no report was forthcoming.

Mr. Chas. Caspari, Jr., Chairman, read the Report of the Committee on Transportation :

REPORT OF THE COMMITTEE ON TRANSPORTATION.

Mr. President and Members of the American Pharmaceutical Association :

Your Committee on Transportation beg leave to report that early in June of the present year application was made to the Trunk Line Association for reduced rates on account of the fifty-fifth annual meeting, but, owing to the unsettled condition of tariff rates, no definite reply was received until July 31. The Trunk Line Association has granted us the usual rate of $1\frac{1}{3}$ fares, on the certificate plan, for the round trip from all points in its territory except West Virginia. On August 8 the New England Passenger Association informed us that the lines in its territory, excepting the Eastern Steamship Company, had agreed to the rate allowed by the Trunk Line Association. The Southeastern Passenger Association and the Southwestern Passenger Bureau have up to the present time declined to make any reduction, claiming that the attendance from these territories is not sufficient to warrant the same. After some correspondence and especially, we believe, upon representation of the Vandalia Line agent at St. Louis, Mo., the Central Passenger Association on August 7 notified us that special fares had been announced as follows: Two cents per mile in each direction from points in the Central Passenger Association territory to Buffalo, Salamanca, Pittsburg, Parkersburg and other eastern gate-ways of this Association, added to rate of one and one-third first-class fare therefrom, the lowest combination thus resulting to be effective via all routes over which short line one-way fares from starting point to New York City regularly apply; tickets of standard form 1-A to be sold on August 30, 31 and September 1 to persons presenting card orders identifying them as members of the American Pharmaceutical Association; return limit September 11, 1907. The Western Passenger Association whose territory lies west of the Missouri river and east of and including Denver, Colo., and Cheyenne, Wyo., states that summer tourist tickets can be had at all points to Chicago and St. Louis, where advantage may then be taken of the Central Passenger Association's special rates. These summer tourist tickets are said to be approximately equivalent to a $1\frac{1}{3}$ fare.

The Central Passenger Association on August 16 supplied us with 100 card orders, which were distributed among the members of our committee residing in that territory. Upon surrender of the card order to the local ticket agent the holder of the same will receive a round-trip ticket from starting-point to destination and return; to make such ticket good for return journey, it will be necessary only for the holder of the ticket to present it to the ticket agent at destination when the return journey is commenced. The ticket agent upon presentation of the ticket will secure the signature of original purchaser on the back of the ticket and stamp it, whereupon it will be good to commence return journey to original starting-point.

The charge of twenty-five cents to all individual holders of certificates for validation of the latter is insisted upon by the railroads granting us the $1\frac{1}{3}$ fare rate, and a special agent of the Trunk Line Association will be in attendance at the meeting on Thursday and Friday, September 5th and 6th, from 9 a. m. to 6 p. m., for the purpose of validating all certificates presented. As an attendance of at least 100 persons holding certificates and paying more than 75 cents fare on the going journey is required to make the reduced rate of $1\frac{1}{3}$ fares operative, it has been agreed by the Trunk Line Association to accept as evidence of attendance, all round-trip tickets issued by the Central Passenger Association, in lieu of certificates, which latter arrangement is very important for our members.

For the Committee,
Baltimore, August 17, 1907.

CHAS. CASPARI, JR.,
Chairman.

On motion of Mr. Oscar Oldberg, of Chicago, the report was ordered received, to take the usual course.

Mr. Hallberg, Chairman, read the Report of the Committee on Local Branches of American Pharmaceutical Association :

REPORT OF THE COMMITTEE ON LOCAL BRANCHES.

The Committee on Organization of Local Branches has endeavored to add to the number established last year and has fairly succeeded. During the year three branches have been established in the most important centers, namely :

New England, comprising the six New England states.

New York, comprising the state of New York.

St. Louis, comprising the tributary territory.

Interest has been maintained in all these local branches with the exception of the one in Washington, which for some reason has not been active during the past year. There are now nine local branches, and efforts have been made and should be continued next year in the following very desirable centers: Buffalo, Pittsburg, Cincinnati, Detroit, Louisville, Kansas City, Omaha, Denver, New Orleans and San Francisco.

The name of the Cleveland Branch has been changed to that of the Northern Ohio Branch.

For the purpose of permanent record in the volume of proceedings for this year it is suggested that the roster of these branches as appearing in the "Bulletin" for August, page 254, be inserted.

The Committee suggests that some one member from each of the cities named above will offer his services to organize branches in their respective localities.

Aside from maintaining interest in the Association and adding to the membership, very interesting meetings have been held for the discussion of questions of much importance to the practicing pharmacist and to the Association.

In the hope that next year will see a large increase in the number of these local branches, this report is

Respectfully submitted,

OTTO F. CLAUS, St. Louis,

C. S. N. HALLBERG, Chicago, *Chairman*.

On motion of Mr. Searby, the report was accepted to take the usual course.

Mr. Hynson, of Baltimore, in the absence of Chairman Diehl, who was sick in Philadelphia, read the Report of the Committee on National Formulary.

REPORT OF THE COMMITTEE ON NATIONAL FORMULARY.

To the American Pharmaceutical Association :

With the pride and satisfaction that must be common to every loyal member of our Association, your committee has the honor of calling attention to the most encouraging and substantial reception given the revised edition of the National Formulary, as abundantly evidenced in the report of the Publication Committee. Indeed, it is believed the Association may be heartily congratulated upon the success of this particular part of its work, and we suggest that it will be only just and proper for the early promoters of the Formulary to have conspicuous and honorable places in the history of this organization.

The unfortunate errors, chiefly typographical, that were discovered in the first copies, were corrected in subsequent issues. The errata were published in the "Bulletin," and every possible effort has been made to supply "Errata Sheets" to those who had received uncorrected copies, the expense of which was less than fifty dollars.

It is, however, not the chief purpose of this committee to speak of the success which has attended the issue of this edition of the National Formulary, or unprofitably refer to its small defects, but rather to submit for your consideration and deliberation the measures which, in our opinion, should be put into effect in order to promote its usefulness, and thus justify the confidence which our lawmakers have manifested when Congress designated the National Formulary as one of the official standards of the Nation for estimating the value and preparing the remedial agents required for the treatment of disease.

A serious responsibility has thus been imposed on this Association, and it behooves us to make every effort to so perfect the work that it shall not alone serve as a useful standard and guide, but shall be cheerfully accepted as such by those who are most closely interested, the practitioners of medicine. Indeed, the interest that the book has already won from the physicians, which is the real and direct object sought by us, points out the desirability of enlisting the co-operation of a committee of practicing physicians in the further work of this committee, by inviting the American Medical Association to appoint such a committee, and it would, doubtless, be a further advantage if the Bureau of Chemistry, Department of Agriculture, and the Marine Hospital and Public Health Service, could be prevailed on severally to nominate one of their attachés to serve, *ex-officio*, as members of these committees. Moreover, the working force of the committee should be augmented by the appointment of auxiliary members to be nominated by the chairman of the sub-committee with whom they are to serve, and to be recommended by the Chairman of the N. F. Committee to the Council for confirmation. The duties of these sub-committees must be lined out in detail after the organization of the committee for work, but may be roughly outlined as follows:

First. The collection and condensation of criticisms on the N. F., or its formulas; such to be reported monthly for inclusion in the Bulletin and published in its entirety, systematically arranged, in the annual Proceedings.

Second. Correction of existing formulas which have been criticised.

Third. Collection of working formulas for preparations suggested for inclusion in the N. F.

Fourth. Selection of preparations proposed for admission into the N. F.; such to be reported monthly for inclusion in the Bulletin.

Fifth. Construction of formulas suitable for admission into the N. F.; such to be reported annually to the Section on Pharmacy and Dispensing.

To conduct this work properly, an adequate sum should be at the disposal of the committee, so that experts can be employed, if necessary, to experiment with the various formulas; to enable a more liberal correspondence with the members; and for other legitimate purposes, which in the past were neglected, owing to the want of a specific appropriation.

Finally, the permanence of the Committee on National Formulary should be assured by appointing its members for the actual term of each revision, which might, if practicable, be made coincident with revision of the United States Pharmacopœia.

Respectfully submitted,

C. LEWIS DIEHL,
C. S. N. HALLBERG,
A. B. STEVENS,
HY. P. HYNSON,
CHARLES H. LAWALL,
Committee."

On motion of Mr. Levy, of New Orleans, the report was ordered received, to take the usual course.

Mr. Hynson also read the supplemental paper referred to in the report of the Committee on National Formulary, and sent by Chairman Diehl with the report.

THE NATIONAL FORMULARY.

BY C. LEWIS DIEHL.

The recognition by Act of Congress of the United States Pharmacopœia and of the National Formulary as official standards for the definition and preparation of medicines has awakened an interest in the National Formulary which, to say the least, has hitherto lain quite dormant, notwithstanding that the work has been before the pharmaceutical profession during two decades. This awakened interest, which is shared by the medical profession, has manifested itself in part by numerous and in some instances harsh criticisms, but in the main the Formulary, now that it has acquired the distinction of an authoritative standard, has been accepted with favor by both professions.

It is, however, not my purpose, even if it were desirable, to reply to these criticisms in particular, but rather to discuss their purport in a general way and to submit some personal opinions concerning future revisions and betterment gathered during a prolonged experience as chairman of the N. F. Committee. The criticisms that have been made since the appearance of the last revised edition concern the errors—chiefly typographical—in the text, the formulas themselves, the scope of the Formulary, and future revisions.

While the errata are confessedly more numerous than careful proof-reading should have admitted, these, with a few exceptions, were not serious; everything has been done to minimize the effect of such by the prompt publication and distribution of a list of all errors found, however trifling, and by the correction of the plates. It must not be overlooked in this connection that one of the principal difficulties encountered in the transposition of quantities was due not so much to the adjustment of metric into apothecaries' value in the present revision, but to the fact that the metric values of the first revised edition were *liberal* transpositions of the original apothecaries' values of the primary edition. This has resulted in some trifling inconsistencies in the apothecaries' equivalents given in some formulas when compared with those for identical metric quantities in others.

Concerning the formulas, many of the criticisms come from persons who, however well qualified, had heretofore apparently given little or no attention to the Formulary or its preparations. Coming from such, unfavorable criticisms, even though apparently justified, are not complimentary to the gentlemen who had during several years assiduously and conscientiously experimented to improve formulas, to correct errors, and to formulate reliable processes or the new admissions proposed and accepted for the revised edition. In this work they were guided solely by the consideration that the formulas are designed for the convenience of the dispenser, to enable him to prepare the various products extemporaneously, if possible or necessary, with the assurance of uniformity in composition; in short, to supply products intended without the intermediary of the manufacturer or his agent, the wholesaler, to go direct from the pharmacist's laboratory to the dispensing counter and thence to the bedside of the patient. The charge, therefore, that some of the preparations are not stable, or that the formulas are not adapted for work on a large scale, may safely be ignored. But it has been charged also that the N. F. contains formulas for many substances and preparations that are of trivial importance, or irrelevant for the treatment of disease, or superfluous for other reasons; that formulas have been admitted which are designed to encourage substitution; that the titles are sometimes inconsistent with the prescribed components, and that the formulary does not establish tests of identity.

To the first of these it may be answered, that in a work of this character it is perfectly con-

sistent to include formulas for products which are in legitimate demand and can be conveniently prepared by the pharmacist, even though they may not be embraced in the armamentarium of the physician. To the second, that while some of the preparations of the N. F. are similar in composition to that claimed for certain proprietary specialties, which, owing to adroit methods of exploitation by their manufacturers, are freely prescribed, such are not included for the purposes of substitution, but, standing on their own merits, are intended to replace the proprietary specialties in the favor of the prescriber. The third charge has been controverted satisfactorily by the committee in a correspondence heretofore published in the "Bulletin," and there remains only the fourth charge, which is probably justified in so far as absolute tests of identity are concerned. It would seem to suffice for a work of this kind, however, to simply establish standards for products which are, as a rule, prepared from materials for which established tests of identity are available in standard works of authority. On the other hand, it must be admitted that in some instances although comparatively few, the nature of the material is open to criticism, and for such both standards of quality and tests of identity should, if practicable, be established.

In conclusion I desire to emphasize that, although I heartily agree that the Committee should at once organize for another revision of the National Formulary, an immediate revision is, in my opinion, neither necessary, nor even desirable, for the following reasons:

1. The important defects found in the "Formulary" have been corrected.
2. It is not reasonable to suppose that such defects in the formulas, which are now observed, on possibly a superficial examination by persons who have not heretofore shown any interest in the N. F., should have escaped the attention of the several chairmen of the sub-committees, who had made careful studies and experiments on the subject during a period of 3 or 4 years preceding the publication of the present edition.
3. On the other hand, it is reasonable to believe that persons heretofore not interested or who had failed to respond to the repeated solicitations of the Committee to call attention to defective formulas, will, now that the "Formulary" has become a legal standard, probably find it to their interest to report defects that have come under their observation.
4. I do not wish it to be understood, however, as rejecting the criticisms that have so far been made concerning the formulas of the present edition. Quite to the contrary: they should be carefully considered, the necessary corrections made, and, after approval by the whole Committee, published in the "Bulletin."
5. Thus the work of revision could go on as expeditiously as is consistent with accuracy and correct observation; bearing in mind that the personal equation is an important factor in this work, and that hasty conclusions may result even more disastrously than has been experienced at any time previously.

On motion of Mr. Asher this paper was also received, to take the usual course.

Mr. Hynson moved that the recommendation of the Committee on National Formulary for appropriation of a sum of money to be used in defraying expenses of experts, be referred to the Council with power to act, and the motion prevailed.

In the absence of the Chairman, the General Secretary read the Report of the General Committee on Membership and Reception.

REPORT OF GENERAL COMMITTEE ON MEMBERSHIP AND RECEPTION.

Your Committee has endeavored to inaugurate a systematic campaign for new members, which, though imperfectly developed, has yet met with some success, and in our opinion could be worked out most completely to great advantage.

An effort was made to utilize the "Bulletin" as far as feasible. Lists of prospective members were secured from our committeemen, the branch secretaries and state association secretaries and other active members. To the persons named in these lists, the "Bulletin" was sent regularly for several months and then a facsimile type-written letter inviting them to join the Association. The results, while less satisfactory than was hoped for, were fairly good, and would no doubt have been better had the solicitation to join been repeated.

A considerable number of the schools and colleges of pharmacy have awarded memberships in the Association as prizes for excellence in scholarship. This plan is deserving of the highest commendation. It interests in our work and brings into our ranks the brightest of our young men at a time when they are most readily impressed with professional ideals.

A few state associations have offered memberships as prizes for meritorious papers and with proper effort it is believed that more will follow their example.

In response to the proposals for membership received through the Bulletin, a personal letter was written to each candidate and an application blank was enclosed. It is believed that it would be well worth while to follow these letters with others until a definite reply or the application for membership is received.

The local branches have been the most effective means for increasing the membership, demonstrating clearly the superior efficiency of personal effort and solicitation to all other plans. We believe that the local branches could do as much to hold as they have done to increase the membership. We should suggest that before any member who resides in a district where there is a local branch is suspended, the secretary of the branch be first advised of the proposed suspension by the Treasurer. In many cases we believe that through the officers or members of the branch the cause of dissatisfaction or diffidence could be removed and the disaffected member could be retained. The loss of 154 members during the last year through suspension and resignation is entirely too great a drain upon our membership, and some way should be found to lessen it.

Another suggestion we would make is that the General Committee on Membership and Reception should be composed of an active member in each state who is not otherwise engaged in the work of the Association and is so situated that he could give a fair amount of time to looking after the bringing in of new members from his state. The practice of selecting the Secretaries of the Local Branches or of the State Associations is not always the best. These members are necessarily very busy with the affairs of their state or local associations and scarcely have time enough to devote to the work of the General Committee on Membership. They can be relied upon to do all in their power in any event. But active and ambitious members who have no other office in the association might be interested in this work through appointment on this committee.

In conclusion your Committee desires to express its most sincere appreciation of the labors of the officers of the Association and of the local branches and the indebtedness to the editor of the "Bulletin."

It is hoped that the total accession to the membership during the year, including the members enrolled at the annual meeting, will reach 500. If this standard is attained it will mark the greatest growth of the Association during any year since its foundation.

STATEMENT OF MEMBERSHIP.

Reported September 1, 1906.....	1868
Enrolled during 1906 meeting	121
Elected since the 1906 meeting and included in 1906 Proceedings.....	92
<hr/>	
Total	2081
Less losses as stated in the 1906 Proceedings:	
Deaths	29
Resignations	36
Suspensions	118
<hr/>	
	183
Net membership as stated in 1906 Proceedings	1898
Elected since publication of Proceedings	172
<hr/>	
Membership as reported September 1, 1907.....	2070
Total new members elected since the 1906 meeting and up to September 1, 1907.	264

STATEMENT OF EXPENDITURES FOR COMMITTEE ON MEMBERSHIP, JULY 1, 1906, TO
JULY 1, 1907.

1906.	
Aug. 1. Wm. Mittelbach.....	\$39 00
Aug. 28. Wm. Mittelbach.....	11 00
Oct. 2. Wm. Mittelbach.....	38 00
Nov. 15. N. W. Branch of A. Ph. A.....	8 00
Nov. 22. Wm. Mittelbach.....	2 50
1907.	
Feb. 6. Wm. B. Day, printing and postage.....	40 35
Feb. 6. Nixon-Jones Printing Co.....	1 25
Feb. 6. Philadelphia Branch A. Ph. A.....	23 00
March 2. W. B. Day, Secretary Chicago Branch.....	18 00
March 22. E. F. Kelly, Secretary Baltimore Branch.....	12 00
June 18. E. F. Kelly, Secretary Baltimore Branch.....	11 00
<hr/>	
	\$204 10

Respectfully submitted,

WM. B. DAY, *Chairman.*

On motion of Mr. Hancock the report was ordered received, to take the usual course.

The Report of the Committee on Proposed Pharmaceutical Collection at Washington was read by the General Secretary, in the absence of the chairman of that Committee.

REPORT OF COMMITTEE ON PROPOSED PHARMACEUTICAL
COLLECTION AT WASHINGTON.

Your Committee begs to submit the following report:

The Chairman of the Committee, while in Washington early in July, had a personal conference with Mr. Rathbun, the Assistant Secretary of the Smithsonian Institution, who is in charge of the National Museum.

The magnificent building in course of construction, it is hoped will be under roof

before winter so that the work on the interior may continue uninterrupted. But even then, it will be two years before the collections can be installed.

Although the floor space of this new museum is several times that of the Congressional Library, it will be possible to provide space for the scientific collections only. The arts will be accommodated in the old building.

So great has been the awakening of the people of the United States as to the possibilities and value of the National Museum, that donations upon donations have been offered, which it has been impossible to accept for want of space to store them, not to mention the impossibility to exhibit them. It would seem inevitable, therefore, that the \$4,000,000 building will soon have to be supplemented by another equally large, if not larger.

While waiting for the completion of the new building and the remodeling of the old, so that the pharmaceutical collections may be properly accommodated, let us hope that the interest manifested in the history of our calling may grow. When the proper time comes the American Pharmaceutical Association ought to be ready to place in the National Museum an exhibit that will do justice to our calling, and that will not fall short when compared with similar exhibits of other professions.

Respectfully submitted,

EDW. KREMERS, *Chairman.*

On motion of Mr. Hancock the report was ordered received, to take the usual course.

The Report of the Committee on the Status of Pharmacists in the Government Service was also read by the General Secretary in the absence of the chairman of that committee.

REPORT OF COMMITTEE ON THE STATUS OF PHARMACISTS IN THE GOVERNMENT SERVICE.

The Committee on the Status of Pharmacists in the Army and Navy submit the following in lieu of a special report. This committee has had no opportunity to promote its usefulness or exert itself during the past year. We have been dormant, but not sleeping. This rest may be advantageous in our future operations, provided Congress will concede to the U. S. Medical Department its demands. The causes for our inactivity were explained in the last year's report, and they remain precisely the same in 1907.

When the medical department has been granted its needed reforms we shall then be in a position to advance and promote our own plans with chances of success. The fact remains that we cannot at present or in future accomplish anything without the harmonious and active co-operation of the medical staff. There are many difficulties in the way of special legislation. The Congressional committees having in charge matters pertaining to medical and pharmaceutical progress, while they have generously provided steel, iron, nickel and lead pills for the use of the army and navy to encourage peace, yet they have been very penurious in providing services and necessities required for maintaining the health of the rank and file of the army and navy. Wisdom may guide and induce these committees to pay more attention in the future to the welfare of Uncle Sam's land and sea forces.

Of course the claims of pharmacists will come last, on account of their amiability, but when they do come their status will undoubtedly develop an organized plan through the efforts of military pharmacists possessing aggressive and soldierly qualities.

The duty of this committee, therefore, is plain. It must act in conjunction with the Medical Department. The army and navy should have the very best medical and pharmaceutical professional service.

This letter is explanatory not only for your information but also for our entire committee and Association; consequently while we consider it prudent to mention these generalities, yet the committee itself can do no more than report progress.

Very truly yours,

GEORGE J. SEABURY, *Chairman.*

On motion of Mr. Claus the report was received and ordered to take the usual course.

The report of the Committee on Reorganization was called for, and Chairman Hallberg made verbal report, and promised to file a written report later. He said that in view on the growth of the Association in the past five years, and the multiplicity of its duties and functions, the Committee felt that the time had come for a change in the method of conducting its now-diversified business. The Committee recommended, therefore, that the business of the Association be conducted largely through the Council, and, if necessary, that the Council should be in continuous session, except when the general Association was in session. The Council should be expanded, and there should be representation on a proportional basis from the various local branches. The Section sessions should be concurrently, as in the American Medical Association, which would result in the Association's being able to complete its labors in three or four days, instead of requiring the whole week, as at present.

Mr. Joseph L. Lemberger commended the views of the committee as verbally expressed by the chairman in a general way. Last year he had ventured a few suggestions himself, and considered that the committee was working along lines that accorded with the views of some of the past officers of the Association. He believed the Association was getting nearer to the solution of the problem of its future course, and while it might be startling to have the committee suggest a continuous session of the Council for the purpose of transacting the business of the Association, in his judgment it was a move in the right direction. He expressed the hope that the committee would make further formal report at the last general session, and give the members something to think over during the coming year, so that next year they would be in a position to shape the course of the Association for greater usefulness. He cited the experience of the morning to show how hard it was for the Association to find the necessary time to do the work before it.

Mr. Asher, of New Orleans, expressed himself as heartily in accord with what Mr. Hallberg said regarding the growth of the business of the Association and the necessity of adopting some adequate system of dealing with it, but he was afraid that the changes proposed might be too radical. He was especially opposed to too large a membership in the Council, as it would make it an unwieldy body and would delay, instead of expedite, business. Mr. Hynson, of Baltimore, suggested that it was not contemplated to have more than two members from one branch or local society,

but Mr. Asher thought even on this basis the representation might be too large, depending on the number of societies represented.

Mr. Roehrig thought the business of the Association would be greatly facilitated if the members would only attend the sessions promptly. This suggestion would also apply to the sessions of the Council.

The Chair put the vote on the question of receiving the preliminary report of the Committee on Reorganization, and it carried.

The Report of the Committee on President's Address was called for, and Mr. Holzhauer, in the absence of the chairman, read the report, as follows :

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Gentlemen : Your Committee which has been delegated to give special consideration to the address of our President begs leave to make the following report :

We concur in the suggestions that the American Pharmaceutical Association should appoint a committee whose aim it would be to act in conjunction with the American Medical Association in furthering the creation of a Federal Department of Health. As our President well reminds us that "Protest against adulteration in drugs and medicines was the immediate cause for the organization of the American Pharmaceutical Association," it seems eminently fitting that over half a century later we should still be found wielding an influence which tends towards the conservation of the health of the public.

We approve of that recommendation that those in charge of the dispensaries of state institutions should be registered pharmacists; and that, in States where regulations in conformity with this opinion do not exist, the subject be agitated by State Pharmaceutical Associations.

We agree that the chicanery indulged in by some manufacturers as to the purport of the serial numbers issued by the Government in connection with the Food and Drugs Act is reprehensible. Deliberate and studied attempts to impute a guarantee of quality by the Government when only a serial number has been assigned is only taking advantage of the credulity of the public in another form, and the practice deserves condemnation. Under the assumption, however, that the Pure Food Commission has already taken cognizance of the practice in question, we ask for definite information from those of our members who are connected with the Department of Agriculture.

In the third paragraph under the caption "Reformation in Medicines," we find these significant words: "If remedies of the second-named class perform what may be read between the lines, they are criminal, and if they don't they are frauds. In either case, the government should suppress the sale." For our part we agree to the recommendation that the postal authorities be communicated with. We believe that since the passage of the Food and Drugs Act of June 30, 1906, such a recommendation will gain a more sympathetic hearing and more intelligent action than ever before.

The further suggestion that the postal authorities be advised in reference to trade journals pure and simple which mask as medical periodicals is approved.

Great strides have been made in recent years relative to the sale of habit-forming drugs, but there is yet room for restrictions along certain lines and in certain localities. The remarks on this subject in general we believe open up further fields for the activities of the Committee on Legislation.

The question of examinations before boards of pharmacy is one, we believe, which can be argued indefinitely, pro and con—much as standards of education for apprentices have been and can be. We feel, however, that with the annual meetings of boards of pharmacy a higher educational standard is gradually being established, and that the remarks

of the President on this topic will be given due consideration in conferences to be held in the immediate future.

"Let the label tell the story," is an excellent idea in connection with the labeling of aqua ammoniæ and various acids. We agree that strength should be indicated by a plain statement as to percentage content.

Motions for appropriations for sums greater than \$250.00 deserve proper deliberation and sometimes further information for satisfactory action by the various members of Council. Still, as withholding votes for seven days may sometimes impede important transactions, we believe that the intent of the recommendation may be served by inviting the special consideration of the Council to this recommendation.

The financial status of the "Bulletin" and a possible extension of its usefulness are, we agree, worthy objects of inquiry.

In conclusion, we wish to emphasize the wisdom of the recommendation that the date of the succeeding meeting be definitely fixed by the new Council prior to adjournment at each annual meeting. With many members, arrangements must be made a considerable time ahead, and it is only fair to allow them the opportunity to do so, and yet we feel that the date of meeting must so largely be controlled by local conditions that it would be better left to Council to fix as early in the year as possible.

W. H. ZOTTMAN,
R. B. GABLE,
CHAS. HOLZHAUER.

Mr. Hynson moved that the report be received and that the recommendations of the Committee be taken up *seriatim*. This motion was seconded by Mr. Godbold. Mr. Oldberg moved that the recommendations be referred to the Council. Mr. Main was opposed to this, and thought the Association itself should pass upon them, and he moved their adoption as a whole. Mr. Hynson accepted this amendment to his motion, and it was seconded by Mr. Claus and carried.

The Chair indicated the presence in the room of the Chairman of the Committee on Time and Place of Next Meeting, and Mr. Schachleiter read the report of his committee, as follows:

REPORT OF COMMITTEE ON TIME AND PLACE OF NEXT MEETING.

To the American Pharmaceutical Association:

Gentlemen: We, your Committee on Time and Place of Meeting, respectfully report receipt of the following invitations and endorsements:

Niagara Falls, N. Y.—Bureau of Publicity, by Secretary.

Put-in-Bay, Ohio.—The Hotel Victory, by Management.

Los Angeles, Cal.—The Los Angeles Retail Druggists' Association, The Merchants' and Manufacturers' Association, The Chamber of Commerce.

Sandusky, Ohio.—The Cedar Point Resort Company, The Ohio State Pharmaceutical Association.

Hot Springs, Ark.—The Arkansas Association of Pharmacists, The State of Arkansas, by the Governor, Hot Springs Retail Druggists' Association, The Business Men's League of Hot Springs, The Board of Trade of the City of Little Rock, The Retail Grocers' and Merchants' Association of Little Rock, The City of Little Rock, by the Mayor, The Pulaski County Medical Society, The Arkansas Medical Society.

After carefully considering all of the data that have come before us, we are a unit in

recommending the acceptance of the invitation of the City of Hot Springs. 'The determining factor of our report is the appreciable accession of membership that we can reasonably expect, and the vast amount of information to be gained by familiarizing ourselves with the curative properties of the waters of this world-renowned resort and sanitarium.

Respectfully submitted,

FRANK G. SCHACHLEITER, *Chairman.*

Mr. G. F. Payne, seconded by Mr. Claus, moved the adoption of the report as submitted.

Mr. Lowe, of Philadelphia, asked if the committee had considered the invitation of the State of Tennessee, as extended through the Governor of the State and the Mayor of Nashville last year. Mr. Schachleiter said that nothing had come before his committee in this connection, and further stated that the committee had purposely delayed their report in order that they might consider every available invitation.

Mr. Searby spoke to the invitation extended by the City of Los Angeles, and proceeded to describe the attractions of that place. He moved as an amendment to the motion to adopt Hot Springs as the next place of meeting that the invitation of Los Angeles be accepted instead. Mr. Remington and Mr. Sheppard both had a kind word to say for Los Angeles as a desirable place of meeting in the near future, but both thought the Association should go to Hot Springs next year.

On motion of Mr. Hynson, of Baltimore, seconded by Mr. Main and Mr. Lowe, the report of the Committee recommending Hot Springs as the next place of meeting was unanimously adopted, with the understanding that the Council should fix the time for the meeting, and the California invitation was referred to the Committee on Time and Place a year hence.

In this connection Mr. Lowe gave a word of warning, based on their experience in the State of Pennsylvania, against fixing upon a certain hotel for the place of meeting without first having a contract with the management as to rates, etc. He thought it would save a good many dollars to observe this precaution.

Mr. Searby, Chairman, read the report of the Committee on Weights and Measures, stating that, as usual, the report was substantially that of the Chairman, as the Committee was too cumbersome to formulate a definite report embodying their views, though he had endeavored as near as possible to have the report represent the views of the committee as he understood them.

REPORT OF THE COMMITTEE ON WEIGHTS AND MEASURES.

To the President and Members of the American Pharmaceutical Association :

Gentlemen : Your Committee on Weights and Measures have not been able to accomplish much, if any good, for two reasons; first, want of time, and second, want of unanimity among the members of the committee.

First as to time: The Chairman was unaware of his appointment until several months after the adjournment of the last annual meeting of the Association, and did not learn

what the duties of the committee were nor the names of the other members until he received a copy of the Annual Proceedings of the Association not many weeks since. As there are forty-five members of the committee, it was not possible to do much in so short a time. Congress was no longer in session, and it seemed best to direct our efforts to making sure of more efficient work next year.

Now, as to the views of the members of the committee: It was shown very forcibly by Mr. Chas. H. LaWall, chairman of this committee for the year 1905 and 1906, that the members of the committee of that year were partly opposed and largely indifferent to the objects for which they were appointed. The chairman of your committee, therefore, decided to ascertain the attitude of the members of the present committee on the subject, and at once sent out a letter to each one with following queries and requested an immediate reply:

"1. Are you in favor of the enactment by Congress of the following bill?

A BILL

To fix the standard of weights and measures by the adoption of the metric system of weights and measures.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress Assembled: That from and after the first of July, nineteen hundred and eight, all the departments of the government of the United States, in the transaction of business requiring the use of weights and measurement, shall employ and use the weights and measures of the metric system.

2. If not in favor of it as it stands, would you favor it if the following exception was added: 'Except in the measurements in the survey of public lands?'

3. Can you suggest any practical action that might be taken by the American Pharmaceutical Association that would hasten the passage of such a law?"

Out of the forty-five (including the chairman) only eighteen replies had been received when it became necessary to formulate this report. These answers were so diverse on many points that it was difficult to tabulate them, but the following summary is practically correct:

Opposed to the proposed law as submitted in question number one.....	10
In favor of the proposed law as submitted in question number one.....	6
Not decided.....	1
No answer.....	1
	<hr/>
	18

Opposed to any such law.....	5
Opposed to proposed law as submitted in number one.....	8
In favor of proposed law or nothing.....	3
Not decided.....	1
No answer.....	1
	<hr/>
	18

Opposed to any such law.....	5
Opposed to proposed law as expressed in number two.....	2
In favor of proposed law with addition as in number two (if it is the best we can get). ..	9
Not decided.....	1
No reply.....	1
	<hr/>
	18

It is manifest that with such differences of opinion among the members of the com-

mittee it would have been impossible to accomplish any good if we had had all the time we needed.

Your committee therefore recommend : * First. That a smaller committee be appointed, not exceeding five in number, who are all known to be favorable to the objects of the Association; that they agree upon some plan of action, and when the time comes for bringing the question before Congress that they seek the co-operation of persons in each State and Territory who will exercise their influence with their respective Senators and Representatives in favor of appropriate legislation.

Second. That at the proper time a delegation of this committee (to be not less than two in number) seek an interview with such congressional committees as may have the question before them for the purpose of demonstrating the practicability of the proposed change.

Third. In view of the known strong objection to a change in our System of Weights and Measures on the part of many large manufacturing and jobbing houses, and also many pharmacists and physicians, that a vigorous campaign of education be conducted for the purpose of familiarizing all parties concerned with the new system, and of overcoming thereby in some considerable degree, their opposition. As aids in this educational work we recommend :

(a) That the use of alternative weights and measures be discontinued in any future edition of the National Formulary that may be published.

(b) That the use of the National Formulary in commentaries and similar works be made conditional upon the doses and quantities being expressed in metric terms only.

(c) That all Colleges of Pharmacy be requested to use the metric weights and measures exclusively in their work, and that students be required to express the doses of all medicines in metric terms.

(d) In order to prepare engineers and others for the early adoption of the metric system and thereby hasten the time when it can be made applicable to all measurements we recommend that the experiment of the Baldwin Locomotive works in building engines to be used in France be made known, and such other similar experiences as can be verified from other American or English firms who may have used this system.

Fourth. That the time fixed in the bill when it shall become operative be not earlier than January, 1911.

Respectfully submitted, W. M. SEARBY, *Chairman*.

On motion of Mr. Claus the report was ordered received and referred for publication.

The General Secretary called attention to the fact that there were some recommendations in the report just read, and on motion of Mr. Sheppard these were referred to the Council.

Mr. Searby, referring to the great loss the Association had suffered in the death of the late Albert E. Ebert, of Chicago, paid tribute to his worth and the great love he had for the American Pharmaceutical Association, which extended to the last moments of his life, receiving material confirmation in the fact that he had left practically his whole property to the Association, and moved the appointment of a committee of three by the Chair to formulate appropriate resolutions and report at the final general

* These recommendations embody the replies to question number three so far as they were sufficiently unanimous to be incorporated into this report. They represent the views of a majority of the committee.

session. This motion was seconded by Mr. Sheppard and others and carried by a unanimous rising vote. The President appointed on this committee Messrs. W. M. Searby of San Francisco, Harry B. Mason of Detroit, and Otto F. Claus of St. Louis.

The Report of Delegates to the National Association of Retail Druggists was called for, and Mr. W. C. Anderson, as Chairman, read the report as follows :

REPORT OF DELEGATES TO THE N. A. R. D.

NEW YORK, N. Y., September 2, 1907.

To the American Pharmaceutical Association :

It was our pleasant duty to represent the A. Ph. A. at the last convention of the N. A. R. D. which was held at Atlanta, Ga., October 2 to 5, 1907.

The notable features of the convention were the large attendance, intense interest and enthusiasm of the delegates, and the number of subjects discussed and acted on.

The opening session was held in the State Capitol, the 400 delegates and their friends making the total number present about 1,300.

It was at this session, which afforded an opportunity for the customary addresses and responses that the chairman of our delegation took occasion to extend to the N. A. R. D. the fraternal greetings, congratulations and good wishes of the A. Ph. A. Every expression of interest in, and appreciation of, the work of the N. A. R. D. as well as each reference to the long and valuable service the A. Ph. A. has given to American pharmacy, met with hearty approval and demonstrated the firmness of the bonds of friendship and interest which bind together our two great national organizations.

The reports of officers showed that the organization was continuing its activity and progress and maintaining a substantial membership and good financial standing.

The affiliated bodies were reported to consist of 36 state and 1,116 local associations.

The total receipts for the year were \$100,375.45 and disbursements \$98,535.12, leaving a balance of \$1,840.33 in the treasury.

The value and extent of the work of the convention is shown by the following resolutions all of which were adopted.

DIRECT CONTRACT PLAN.

Resolved, That we hereby strongly reaffirm our position in favor of the direct contract and serial numbering plan of marketing proprietary medicines as the only plan guaranteeing justice, equity and adequate compensation to the manufacturer and jobber and retailer.

Resolved, That we commend those manufacturers who by the adoption of this plan have honestly shown their earnest desire to protect the price and reputation of their products.

Resolved, That the Secretary is hereby requested to compile and transmit to the affiliated organizations a list of the manufacturers and their several products which are now being marketed under the direct contract and serial numbering plan.

Whereas, It appears that there are many jobbers or wholesale druggists who are sole owners of proprietary medicines and who are not marketing the same under the direct contract and serial numbering plan; therefore, be it

Resolved, That we urge upon such jobbers or wholesale druggists that they show in a practical manner their disposition to protect the price of their products by the adoption of this plan.

BUYING CLUBS.

Resolved, That it is the sense of this convention that buying clubs, their formation and conduct, are local affairs in which the N. A. R. D. should not take any part.

Resolved, further, That the formation of a National Buying Club by the N. A. R. D. is not feasible at this time, and that the only position the N. A. R. D. should take on the buying question is, that in conformity with the principle of "To Live and Let Live," and "Equal Opportunities for All," manufacturers should accord retail druggists the same privileges and terms in buying as are accorded large firms and corporations.

Resolved, That we reaffirm our opposition to a jobbing price to the retailer in excess of \$2, \$4 and \$8, on proprietary medicines, food products and other articles sold by the retail drug trade.

SALES TO GROCERS, MAIL-ORDER HOUSES, ETC.

Resolved, That we again protest against sales by manufacturers and jobbers of proprietary medicines, pharmaceuticals, surgical dressings, chemicals, etc., direct to consumers, grocers, department stores, and mail-order houses.

Resolved, That the Executive Committee is instructed to use its best efforts to remedy these conditions.

ADVERTISING.

Resolved, That we again approve the action of those manufacturers who are endeavoring to prevent the advertising of their products at ruinous prices; and they are again urged to caution the public in their advertising matter against the purchase of mutilated packages.

EXCHANGING GOODS.

Resolved, That the plan of some so-called drug jobbers of exchanging over-stocks of proprietary medicines is proving detrimental to the interests of the legitimate drug trade. We urge therefore, our members to make no such exchange except through regular drug jobbing channels.

CUT-RATE SIGNS.

Resolved, That the display of signs of cut-rate prices on proprietary medicines being incompatible with the spirit of our Association, we request that members discontinue, whenever practicable, their use of such signs.

FREE SAMPLE PACKAGES.

Resolved, That we oppose the practice of some proprietors in giving away free packages of their products, and relying upon the retail druggists for their distribution, unless such proprietors are willing to allow the retail druggists full price for each package so distributed.

WINDOW DISPLAYS, ETC.

Resolved, That we condemn the practice of many druggists in giving window displays, and in otherwise aggressively pushing the goods of manufacturers who persistently refuse to adopt any method by which the retail price of their remedies may be protected.

TRADING STAMPS.

Resolved, That we again affirm our opposition to the use of trading stamps and rebate checks as being prejudicial to the welfare of the drug trade and direct the Executive Committee to use every possible means in their power to discourage their use.

TELEPHONES.

Resolved, That the report of the National Telephone Committee is hereby approved, and this Association recommends that the local associations at once appoint telephone committees to carry out the suggestions embodied in the report of the National Telephone Committee.

PHARMACEUTICAL EDUCATION.

Whereas, The National Association of Retail Druggists has always stood for progress in the education of those who are employed as assistants in our stores, and

Whereas, The practical education acquired by daily work behind the counter of a drug-store should count as much as, or more than, the clinical experience so much appreciated and sought after by medical students; therefore, be it

Resolved, That this Association recommend that a drug-store experience of at least four years shall be required by colleges of pharmacy and university schools of pharmacy before granting their degree certifying to the competency of the graduate to practice pharmacy; and be it

Resolved further, That every applicant for an apprenticeship and for a certificate to practice pharmacy shall first pass an educational test to be prescribed by the State Pharmacy Board.

RELATIONS WITH PHYSICIANS.

Resolved, That fraternal relations should be encouraged between physicians and pharmacists, to the end that each should be guaranteed the benefits rightly accruing to the discharge of the duties of their respective occupations.

Resolved, That the work of eliminating from the practice of pharmacy and medicine as far as may be practicable, unethical, secret, and in some cases fraudulent and dangerous compounds, as undertaken by the medical profession, be encouraged by our Executive Committee.

Resolved, That the dangerous practice indulged in by some practitioners of medicine in usurping the rights and prerogatives of pharmacists is emphatically condemned.

Resolved, That the practice of counter prescribing by some druggists by which the functions of medical practitioners are usurped, is hereby condemned.

NATIONAL FORMULARY PRODUCTS.

Whereas, The retail drug trade would receive large benefits from the more extended use of National Formulary and U. S. Pharmacopœia preparations by physicians, therefore be it

Resolved, That the Executive Committee is hereby instructed to devise and transmit to the affiliated organizations at the earliest date practicable, a plan by which local organizations can undertake this work of popularizing National Formulary and Pharmacopœia preparations upon a uniform and practical basis.

Resolved, That all associations and members are requested to submit to the Executive Committee any suggestions or plans that may aid the Executive Committee in the work of preparing such plans.

Resolved, That the Executive Committee is instructed to confer with the committee on ethical preparations of the American Medical Association, to the end that the active support and co-operation of the medical profession may be had in extending the use of National Formulary and Pharmacopœia preparations.

GUARANTEE UNDER NATIONAL PURE FOOD AND DRUGS LAW.

Whereas, The National Pure Food and Drugs Law passed at the last session of Congress has not yet gone into effect, nor have the rules and regulations governing the same been promulgated by the commission provided for under the law; and,

Whereas, We cannot at this time determine the effect of these regulations on the retail drug trade, but do not know that the manufacturer and jobber doing an interstate business must supply a guarantee to the retail dealer; therefore, be it

Resolved, That we recommend to this Association that the retail druggist buying outside of his State insist in all cases on having his purchase comply with the National

Pure Food Law, and that the manufacturer and jobber supply him with proper guarantee to relieve him from prosecution under this law.

PURITY OF DRUGS.

Resolved, That this Association favors the passage of all state laws that will fix a reasonably high standard for the purity of drugs and medicines. The standard of purity of all state laws should be based on the standard fixed in the U. S. P. and N. F., and no deviation from the same should be allowed.

Resolved, That all laws relating to pharmacy and the sale of drugs should be placed under the jurisdiction of the State Boards of Pharmacy for enforcement; and,

Resolved, further, That as professional men we should in the case of drugs and chemicals give the same an analysis or examination to prove their purity, and if the same are not found to conform to the standard fixed they should be returned to the manufacturer or jobber from whom purchased.

CRUDE DRUGS.

Resolved, That it is the sense of this Association that manufacturers, jobbers and importers of crude drugs, chemicals and medicines, instead of labeling their goods by means of an antiquated system of number or letter, should hereafter designate the strength of their products by percentage only.

ANTI-TRUST LAWS.

Resolved, That the anti-trust laws of the nation and state should not be used to stifle and prevent organization and co-operation among the smaller trade interests which seek only to preserve their own commercial existence in the face of the efforts of powerful and selfish monopolies gradually eliminating the small dealer.

Resolved, That if a proper legal construction of such anti-trust laws embodies a prohibition of co-operation among the smaller merchants, then in such cases and with reference thereto, said anti-trust laws are fundamentally wrong in their conception, enactment and operative effect, and require amendment: and be it finally

Resolved, That a copy of these resolutions be presented to all Senators and Congressmen, to the press and to the heads of all other national and retail associations.

POSTAL LEGISLATION.

Whereas, For several years past a parcels-post measure has been introduced in Congress and the continued agitation for some change in our postal laws indicates the probability of postal legislation of some kind in the near future, be it

Resolved, That we oppose so-called parcel-post legislation, believing that such legislation would prove of comparatively no advantage to the public at large, resulting simply in extending the business of a few large corporations to the great detriment of retail distributors, merchants who constitute about 20 per cent. of the population of the country. Be it further

Resolved, That we approve and urge, at the earliest time at which the public revenues will justify, a reduction in the rate of first-class postage in the United States to one cent an ounce. Be it further

Resolved, That a copy of these resolutions be transmitted to the members of the United States Congress and to the State and local associations affiliated with this body.

NATIONAL AND STATE LEGISLATION.

Resolved, That this Association congratulates the people of this country upon the passage of a National Pure Food and Drugs Law, and that we hereby pledge ourselves to assist with all our power in the proper enforcement of the same.

Resolved, That this Association will give its active support to any bill which contemplates raising the rank of naval pharmacists.

Resolved, That the National Association of Boards of Pharmacy be requested to secure a greater uniformity in the various state pharmacy laws, a general interchange of certificates and the enactment of anti-narcotic laws in those states which do not have such laws.

Resolved, That the Committee on Legislation is hereby instructed to secure national legislation for the control of the sale of narcotics as between the states.

Resolved, That the Executive Committee is hereby instructed to request the various state pharmaceutical associations to secure adequate legislation in order to prevent the sale of medicines by irresponsible, itinerant vendors.

Resolved, That the thanks of this Association are due to the Committee on Legislation for its efforts on behalf of the Mann bill and other national legislation.

Resolved further, That the recommendation of said committee be approved, and that a special committee of three be appointed by the President, which special committee shall investigate the present patent laws and prepare a bill embodying the principles to which the N. A. R. D. originally declared itself, and such bill shall then be pushed for enactment by the Committee on National Legislation and the Executive Committee.

Resolved further, That in view of the important and varied matters affecting the interests of the pharmacists which come before Congress and before the state legislatures year after year, we urge upon pharmacists everywhere to see to it that their interests are represented in legislative bodies by members of our profession.

CALIFORNIA RELIEF WORK.

Whereas, During the past year an unequaled disaster in the history of our country befell the citizens of San Francisco and vicinity, and

Whereas, The generous expressions of sympathy and financial support were so universal, be it

Resolved, That we express in the most sincere and cordial terms our appreciation of the general contributions by retail druggists, wholesale druggists and manufacturers in providing a fund for the relief of the suffering druggists of San Francisco, also the assistance given us by the pharmaceutical press.

Resolved, That we express our thanks to the druggists of San Francisco who have given so unselfishly of their time and efforts in distributing the fund collected by the Executive Committee to the sufferers in San Francisco.

SUNDAY CLOSING.

Whereas, The resolutions adopted by this Association at St. Louis in 1904 and reaffirmed at Boston in 1905, have received the approval of many druggists throughout the country; and

Whereas, The druggists of the United States fully recognize the need of a weekly rest day for themselves and their employees, therefore be it

Resolved, That the National Association of Retail Druggists hereby reaffirms its previous declarations fraternally requesting druggists to limit their Sunday business to work of necessity and mercy.

FRATERNAL RELATIONS.

Resolved, That we note with great pleasure the many evidences of friendly co-operation existing between the associations representing the various branches of the drug trade, and we wish here to express the hope that this warm spirit of co-operation may grow during the coming year.

FRIENDLY ATTITUDE OF THE PRESS.

Resolved, That we note with gratification the friendly attitude and favorable comment of the pharmaceutical press.

POSTERS.

Resolved, That the National Association of Retail Druggists in convention assembled expresses its condemnation of the character of poster and other forms of advertisement displayed and circulated by certain manufacturers of proprietary medicines which are suggestive and border upon the obscene, and which tend to offend the public morals.

THANKS.

Resolved, That the thanks of this Association be extended to the Conference of Pharmaceutical Faculties for its action in sending delegates to this convention and that we cordially invite the conference to send delegates next year.

Resolved further, That we extend a cordial invitation to the National Association of Boards of Pharmacy to send delegates to our next convention.

Resolved, That the thanks of this Association are hereby tendered to the citizens of Atlanta and of Georgia, the Georgia State Pharmaceutical Association and the Atlanta Retail Druggists' Association for the cordial welcome and generous entertainment accorded the members of the Association at this convention, also to the ladies of Atlanta, the daily press of Atlanta, the telephone companies, the hotels and the local Entertainment Committee.

Resolved, That the thanks of this convention are hereby tendered to our retiring President, M. T. Breslin, to Secretary Thomas Wooten, to Treasurer Charles F. Mann, to Simon N. Jones, Chairman of the Executive Committee, and to the members of the Executive Committee individually, and to members of all standing committees for their earnest efforts in behalf of the Association during the year past. Also the general counsel, editor of notes and general organizer.

A pleasant and profitable feature of the convention was the presence of the newly-organized Woman's Organization of the N. A. R. D. and the interesting, instructive and able address of the President, Mrs. Emma Gary Wallace of Boston.

Southern hospitality was thoroughly demonstrated in the entertainment which was provided, and the care with which every detail for the comfort, convenience and pleasure of the delegates was looked after.

In conclusion, we wish to express the hope that true fraternity and co-operation between the A. Ph. A. and the N. A. R. D. may always continue and through it each be strengthened and encouraged in their great work for pharmacy and the pharmacist.

For the Committee,

WILLIAM C. ANDERSON, *Chairman*.

On motion of Mr. Remington, of Philadelphia, the report was received and ordered to take the usual course.

The report of delegates to the American Medical Association was read by Mr. J. P. Remington, chairman.

REPORT OF THE DELEGATES TO THE AMERICAN MEDICAL ASSOCIATION.

This Association met in the Hotel Marlborough, Atlantic City, June 4, 1907. The delegation was received by the Section on Pharmacy and Therapeutics; four of the delegates of this body being in attendance. A larger attendance was noticed in this Section than at previous meetings; the President being Dr. Horatio C. Wood, Jr., of Philadelphia. A lively discussion ensued when the report upon the United States Pharmacopoeia was presented. As was to be expected much work remains to be done before the physicians of the United States will take much interest in revising the Pharmacopoeia; nevertheless there was more interest displayed at this annual meeting than ever before. A new and effective feature was the exhibition of the Philadelphia branch of

the American Pharmaceutical Association of Pharmacopoeial and National Formulary preparations. Appropriate space was secured in the exhibition hall and a committee from the Philadelphia branch of the A. Ph. A. devoted much of their time to explaining the uses and properties of the specimens. They certainly were missionaries for better pharmacy. The "Journal of the American Medical Associations" made an editorial comment on this exhibition which is as follows:

"In this connection one must call attention to the most interesting display of the Philadelphia branch of the American Pharmaceutical Association. These pharmacists showed an array of elegant pharmaceuticals, put up in accordance with the U. S. Pharmacopoeia and National Formulary. They were certainly attractive. Those in charge emphasized the fact that any competent pharmacist can prepare elegant and accurate products, and urged that physicians co-operate by prescribing such articles.

"Another part of the exhibit made by the Philadelphia pharmacists consisted of various nostrums, some offered to the public, some offered to the profession, and some offered to both, with comparisons made between their claims and the real facts as regards composition and therapeutic power. This exhibit was the center of an interested group all of the time."

While it would be invidious to mention the names of the more active members of this Committee in attending to the details of this exhibition it is but just to state that a great part of the labor fell upon the able shoulders of M. I. Wilbert. This exhibition with the lively discussions in the sections on the United States Pharmacopoeia were the chief features of interest. It is true that there were many heated arguments, but it is probable that no other way than aggressive tactics will be effective in arousing medical interest to the point of accomplishing practical results. It seems certain that before the next convention for revising the Pharmacopoeia meets, there will be much activity in medical circles, and the practice of medicine will be adequately represented. In this connection it may be stated that the preparations of the U. S. P. and National Formulary will be again utilized at the meeting of the Pennsylvania Medical Association at Reading, through the delegates appointed to attend this meeting by the Pennsylvania Pharmaceutical Association. This method of reaching the doctors has proved very successful, and it is hoped that it may prove valuable in other sections of the country.

JOSEPH P. REMINGTON,
Chairman of the Committee.

On motion of Mr. Oldberg the report was ordered received, to take the usual course.

The report of delegates to the National Wholesale Druggists' Association was called for, and Mr. C. A. Mayo, a member of the committee, made verbal report in the absence of the chairman. Mr. Mayo said that the chairman of the delegation was unable to attend the meeting of the National Wholesale Druggists' Association held in the city of Washington last fall, and had requested him, as a member of the delegation, to attend. He was cordially received, and was impressed with the fact that the meeting was concerned more with pharmacy than had ever been the case in the history of the National Wholesale Druggists' Association. This was largely because of the interest of the pharmaceutical profession in the National Pure Food and Drug Law. Dr. Wiley, chief chemist in the Department of Agriculture, made an address, and Dr. True made an address on the cultivation of drug plants. The Association appointed a

Committee on Standards, and it was interesting to note, and it might be a matter of surprise to know, that as chairman of that committee they selected a member of the American Pharmaceutical Association, Mr. Thomas F. Main, of New York. Mr. Mayo said this covered the main points of interest in connection with that meeting.

The President said this was a good report, and he trusted that this example of stating the substance of things, leaving the full text of such reports to be published in the Proceedings, and also in the "Bulletin" of the Association, would be followed at future sessions.

On motion of Mr. Francis B. Hays the verbal report made by Mr. Mayo was ordered received and referred for publication.

Mr. H. P. Hynson, acting for the chairman of the delegation, Mr. W. C. Carson, who was not present, presented the greetings of the Maryland Pharmaceutical Association in writing, and submitted a code of ethics which had been modified and readopted by that Association during its last meeting. On motion of Mr. Claus, seconded by Mr. Roehrig, the documents were received and referred for publication. Their full text here follows :

Mr. President and Gentlemen :

The Maryland Pharmaceutical Association extends most cordial greetings to the American Pharmaceutical Association, and in view of the probable closer affiliation of State Associations with your most worthy organization, through representatives from these in your Council, calls your especial attention to part of a communication presented by the Maryland Association at the Golden Jubilee meeting in 1902 and which is, at this time, heartily reiterated and is as follows :

"Believing a confederation of the several accredited State Associations very desirable and feeling assured that representation, by delegates, in such a body as your own, would greatly develop and enlarge the powers of these local societies, this Association humbly but earnestly petitions your honorable selves to so alter and amend your Constitution and By-Laws as will give delegates from State Associations more conspicuous and potent influence in the several sections of the American Pharmaceutical Association, whereby its honorable career may be continued and its influence and usefulness greatly extended, as is so fondly hoped by all."

The Maryland Association would, indeed, be happy and proud if it should appear that these suggestions, offered the year before Mr. Frederick T. Gordon proposed the formation of local branches, had had any effect in bringing about this most helpful movement.

In slightly modified form, the Association we represent, at its annual meeting this year, re-adopted its Code of Ethics, a copy of which is attached for the consideration and criticism of your members.

Respectfully submitted for the delegation,

W. C. CARSON, *Chairman.*

CODE OF ETHICS

For the guidance of members of this Association and all pharmacists of the State who may wish to follow the higher practice of their profession :

Respecting the Pharmacist Himself.

1. He should, by study, experimentation, investigation and practice, thoroughly

qualify himself to fully meet and competently transact the daily requirements of his vocation.

2. He should possess a good moral character, and should not be addicted to the improper use of narcotic drugs nor the excessive use of alcoholic stimulants.

3. He should constantly endeavor to enlarge his store of knowledge; he should, as far as possible, read current pharmaceutical literature; he should encourage all such pharmaceutical organizations as seem to be helpful to the profession, and so deport himself as not to detract from the dignity and honor of the calling which this Association, especially, is trying to elevate.

4. He should accept the standards and requirements of the U. S. Pharmacopœia and the National Formulary for the articles of *Materia Medica* and the preparations recognized by these publications and, as far as possible, should promote the use of these and discourage the use of proprietaries and nostrums.

Respecting the Pharmacist's Relations with Those from whom He Makes Purchases.

1. He should deal fairly with these; all goods received in error or excess and all undercharges, should be as promptly reported as are shortages and overcharges. Containers not charged for or not included in the charge for contents should be carefully returned, or, if used, should be credited to the party to whom they belong.

2. He should earnestly strive to follow all trade regulations and rules, promptly meet obligations, closely follow all contracts and agreements and should not encourage or sanction any division of quality purchases not contemplated in the terms of sale.

Respecting the Pharmacist's Relations with his Fellow-Pharmacist.

1. In this relationship he should, especially, "do as he would be done by." He should not make any comment or use any form of advertisement that will reflect upon the members of the profession, generally or specifically. Nor should he do that which will in any way discredit the standing of other pharmacists in the minds of either physicians or laymen.

2. He should not obtain, surreptitiously, or use the private formulas of another, nor should he imitate or use another's preparations, labels or special forms of advertising.

3. He should not fill orders or prescriptions which come to him by mistake. Prescription containers with copies and labels of another pharmacist upon them may be filled by him upon request, but he must invariably replace the labels with his own, thereby assuming proper responsibility.

4. He should never request the copy of a prescription from another pharmacist; the owner of the prescription alone being entitled to a copy, is the proper person to ask for it.

5. He may borrow merchandise from another pharmacist, provided the practice is reciprocal and equally agreeable to both parties; but the better form is to pay a sum for the desired article equal to the cost and half the profit to be obtained.

Respecting the Pharmacist's Relations with Physicians.

1. He should positively refuse to prescribe for customers except in cases of urgent emergency.

2. He should not, under any circumstances, substitute one article for another, or one make of an article for another, in a physician's prescription, without the physician's consent.

3. He should refuse to refill prescriptions or give copies of them when so instructed by the physician.

4. He should not place copies of prescriptions upon containers unless ordered to do so by the prescriber, even though the patient should request it. Nor should he use any

word or label like: "For External Use," "Poison," "Caution," etc., without due regard for the wishes of the prescriber, provided the safety of the patient and family is not jeopardized.

5. Whenever there is a doubt as to the correctness of the physician's prescription or directions, he should invariably confer with the physician in order to avoid possible mistakes or unpleasantness; changes in prescriptions should not be made without such conference.

6. He should never discuss physicians' prescriptions with customers, nor disclose to them their composition.

Respecting the Pharmacist's Relations with his Patrons.

1. He should seek to enlist and merit the confidence of his customers, which, when won, should be jealously guarded and never abused by extortion or misrepresentation.

2. He should supply products of standard quality only to patrons, excepting when something inferior is specified and paid for by them.

3. He should charge no more than fair, equitable prices for merchandise and prescriptions; the time required for the proper preparation of prescriptions should be duly considered and paid for.

4. He should hold the safety and health of his patrons to be of first consideration; he should make no attempt to treat diseases nor strive to sell nostrums or specifics simply for the sake of profit.

5. He should consider the reckless or continued sale of drugs to habitues, the illicit sale of abortive medicines or poisons, to be practices unbecoming a gentleman, a pharmacist or a member of this Association.

There being no further business before the Association at this time, the President declared an adjournment to Saturday morning, September 7th, at nine o'clock, according to program.

THIRD SESSION—TUESDAY AFTERNOON, SEPTEMBER 3, 1907.

No business was transacted by the Association previous to the first session of the Section on Practical Pharmacy and Dispensing.

FOURTH SESSION—TUESDAY EVENING, SEPTEMBER 3, 1907.

No business was transacted previous to the second session of the Section on Practical Pharmacy and Dispensing.

FIFTH SESSION—WEDNESDAY MORNING, SEPTEMBER 4, 1907.

No business was transacted previous to the first session of the Section on Education and Legislation.

SIXTH SESSION—WEDNESDAY AFTERNOON, SEPTEMBER 4, 1907.

No business was transacted previous to the second session of the Section on Education and Legislation.

SEVENTH SESSION—THURSDAY MORNING, SEPTEMBER 5, 1907.

No business was transacted previous to the first session of the Section on Scientific Papers and the first session of the Section on Commercial Interests, held simultaneously.

EIGHTH SESSION—THURSDAY AFTERNOON, SEPTEMBER 5, 1907.

No business was transacted previous to the second session of the Section on Scientific Papers and the second session of the Section on Commercial Interests, held simultaneously.

NINTH SESSION—FRIDAY MORNING, SEPTEMBER 6, 1907.

No business was transacted previous to the first (and only) session of the Section on Historical Pharmacy.

TENTH (AND FINAL) SESSION—SATURDAY MORNING, SEPTEMBER 7, 1907.

President Eliel did not call the last general session of the Association to order until 10.15 A. M., the delay being occasioned by the late hours the Association kept at Coney Island the night before.

The Chair called upon the Secretary to read the minutes of the second general session on Tuesday morning, which he did, and the minutes, on motion of Mr. Sayre, were approved as read.

Report from the Committee on Reorganization was called for, but the Chairman (Mr. Hallberg) was not quite ready to report. There was also no report ready from the Committee on Publicity, Mr. E. H. Gane, Chairman, and the report of the Committee on William Procter, Jr., Monument Fund was likewise passed for the time being, on account of the absence of Chairman Hancock.

The reading of the minutes of the Council was called for as the next order of business, and Secretary Whelpley read the minutes of the fourth and fifth sessions held September 4 and 5, 1907.

FOURTH SESSION OF THE COUNCIL—SEPTEMBER 4, 1907, 9:30 A. M.

Vice-Chairman Roehrig in the Chair.

Present: Messrs. Roehrig, Hitchcock, Meissner, Remington, Caspari, Claus, Oldberg, Sheppard, Whelpley, Beal, Cook, Kniseley, Eliel, Wilbert.

On motion by Mr. Sheppard the Committee on Prize Certificate was relieved of further duties.

On motion by Mr. Sheppard, seconded by Mr. Remington, it was agreed to adopt the following form of letter and certificates to be used in connection with nominations to membership in the A. Ph. A. awarded as prizes by Schools or Colleges of Pharmacy, Boards of Pharmacy or individuals:

AMERICAN PHARMACEUTICAL ASSOCIATION.

.....

Dear Sir: You are hereby informed that you have been awarded the prize of by for
 A certificate of membership in the American Pharmaceutical Association, signed by the President and other officers, will be forwarded to you immediately after your election.

On our regular certificate of membership, to be given as stated above, will be written the following statement:

This certificate was awarded as a prize to, for superior standing in

Said statement, also the above letter, to be signed by the person or representative of the Institution giving the prize.

J. P. Remington was instructed to have 1,000 copies of the letter printed.

The sum of \$10 was appropriated to cover expense of the committee on prize-certificate.

The price of the certificates of membership was reduced to \$3.00 for paper and \$5.00 for parchment.

On motion by Mr. Whelpley seconded by Mr. Oldberg, the recommendation of the committee on publication relative to the prices on National Formulary was adopted.

Discussed by Messrs. Hitchcock, Meissner, Eliel, Sheppard, Caspari, Whelpley, Remington, Røehrig.

On motion applicants Nos. 321 to 342 inclusive were elected.

On motion, duly seconded, it was agreed that all discounts heretofore allowed dealers on orders for National Formulary be canceled and that the following scale of discounts be put into effect at once:

On orders for 1 to 10 copies inclusive, 10 per cent.

On orders for not less than 50 copies, 20 per cent.

On orders for not less than 100 copies, 25 per cent.

On motion the Council adjourned.

FIFTH SESSION OF THE COUNCIL—SEPTEMBER 5, 1907, 9:30 A. M.

Minutes of previous meeting not read.

Present Messrs. Beal, Caspari, Claus, Eliel, Hallberg, Lemberger, Meissner, Røehrig, Sheppard, Whelpley, Wilbert, Hancock, Remington.

On motion by Mr. Oldberg, seconded by Mr. Caspari, the following amendments to the By-Laws were referred to the Association at large with favorable recommendation:

Amend the By-Laws by changing the numbers of Chapters I, II, III, IV, V, VI, VII, VIII, IX and X to Chapters II, III, IV, V, VI, VII, VIII, IX, X and XI respectively, and add another chapter to be known as Chapter I, as follows:

CHAPTER I.

OF THE ELECTION OF OFFICERS.

Article I. A Nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

Article II. The Nominating Committee shall submit the names of three persons as candidates for each of the offices of President, First Vice-President, Second Vice-President, Third Vice-President, and three members of the Council. These names are to be

submitted by the General Secretary by mail to every member of the Association, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after the adjournment of the annual meeting.

Article III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the *Bulletin* of the Association.

Article IV. The officers thus elected by a majority vote of the members of the Association shall be installed at the final general session of the next annual meeting.

Article V. The Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary shall be elected annually by the Council.

A motion by Mr. Remington, seconded by Mr. Hallberg, to have the election of a local secretary postponed one month was lost.

On motion by Mr. Hallberg, seconded by Mr. Meissner, Martin A. Eisele was elected local secretary for the meeting of 1908.

On motion by Mr. Hallberg, seconded by Mr. Whelpley, the date of the 1908 meeting was fixed for the second week in September.

On motion by Mr. Remington, seconded by Mr. Oldberg, the expense of the Ebert Memorial Volume, prepared by the executors of the Ebert estate, is to be paid by the A. Ph. A.

On motion by Mr. Remington, seconded by Mr. Whelpley, a sufficient number of copies of the Ebert Memorial Volume is authorized to cover the membership list of the A. Ph. A. and the exchanges, estimated at a total of 2,500.

The following was received, and a vote of thanks tendered Mr. Mittelbach for his interest in the A. Ph. A.:

BOONVILLE, MO., Aug. 26, 1907.

"To the Council of the American Pharmaceutical Association:

Gentlemen: The printed Proceedings of our Association upon which so much stress is laid as being worth the annual dues, should be issued earlier than they have been in the last few years. The Proceedings *are* worth the money if issued promptly. There is no good reason why a copy should not be in the hands of every member by November 1st each year. I know the General Secretary will at once say that under present circumstances, and with the limited amount of money and help at his command, such a thing is impossible. The Association should provide him with the necessary means to do so. The rank and file of our membership will appreciate such action. Only a few of us can attend the meetings regularly, and get the benefit of the discussions at our annual meetings. The great majority, however, must wait until the succeeding spring before they get our Proceedings. Interest in same is, to a great extent, lost, after such a long lapse of time. It is true that the 'Bulletin' and the various drug journals disseminate much of the matter brought before our meetings; but the discussions of our various reports and papers are not printed by these journals, and can only be obtained from our printed Proceedings. The remarks and comments by the members are often the most interesting part of a paper or report. I am sure you will all agree with me. There is no valid excuse for the American Pharmaceutical Association to issue its Proceedings so late. Provide the General Secretary with the proper sinews of war, and I know he will do his part. The 'Bulletin' fills a good part in the advancement of our dear Association; but it does not answer as a substitute for the printed Proceedings. Let us have the 1907 Proceedings by November 1st this year.

The annual clash between the Association and the local Entertainment Committee is again on. This matter seems to be hard to adjust to the satisfaction of all. Your com-

mittee that drafted the skeleton program, and which program was duly accepted by the Council, considered this matter thoroughly, but without coming to a definite agreement. Personally I am in favor of accepting all such entertainment as will take a reasonable amount of our time. If the Association of Boards of Pharmacy and Teaching Faculties will hold their meetings on Saturday before our meeting there ought to be ample time to transact our business and still give the Entertainment Committee a chance. The skeleton program prepared is upon the supposition that the Association of Boards of Pharmacy and Teaching Faculties complete their work before our meeting is opened. Their deliberations can be laid before the A. Ph. A. through the Section on Education and Legislation, and will not take up any of the time belonging to the other sections. The attendance at our meetings is growing steadily in proportion to the increase of membership. Many of the new members, and some of the old ones, come to our meetings partly for pleasure and recreation. Cut off the entertainment and the attendance will decrease. And besides that, the hard workers that carry on our work need a little pleasure, too. 'All work and no play makes Jack a dull boy.' The program fixed for our entertainment this year at New York City is a splendid one, and interferes but little with our work. It fits in very nicely with the skeleton program adopted. My reasons for bringing the above to your attention is the growing tendency among some of our regular attendants at the meetings to eliminate entertainments entirely from these gatherings. Don't do it!

I hope the members of the Council will excuse me for 'butting in' from such a great distance. I wish I could be with you in person. I regret very much, at this time especially, to be absent at roll-call. Having honored me with the second highest office in the Association, I ought to be with you. Can't help it this time, my dear friends. Those of you who are retailers know that such circumstances will arise, often when least expected. I am with you in spirit, and wish you a successful meeting. I do hope the Association will carry out my plan, and have a copy of the printed Proceedings of this meeting in the hands of every member by November 1st. With kindest regards and best wishes to all, I am

Very truly yours,

WM. MITTELBACH."

It was discussed by Messrs. Hallberg, Lemberger, Caspari, Eliel, Meissner and Remington.

Mr. Lemberger presented a telegram from Mr. Wm. Saunders.

On motion of Mr. Remington this was received and filed.

On motion the Council adjourned until 9 o'clock to-morrow morning.

Mr. Sayre moved the adoption of the minutes as read.

Mr. Main asked if the adoption of the minutes as read carried with it, without further action of the Association, the new manner of election of officers provided for, and was assured by Mr. Whelpley and the Chair and the General Secretary that it did, and that it did not apply until next year.

The Chair then put the vote upon the motion to adopt the minutes and it carried.

Secretary Whelpley read the minutes of the sixth session of the Council, held September 6, 1907.

SIXTH SESSION OF THE COUNCIL—SEPTEMBER 6, 1907, 9:30 A. M.

The Council met with Vice-Chairman Roehrig in the Chair, and the following additional members present: Messrs. Caspari, Claus, Eliel, Hallberg, Hitchcock, Lemberger, McIntyre, Meissner, Oldberg, Roehrig, Sheppard and Whelpley.

The minutes of the fourth and fifth sessions were read and approved.

On motion applicants Nos. 343 to 348 were duly elected.

On motion the sum of \$300 was appropriated to cover the honorarium of the editor of the "Bulletin" for one and one-half years.

On motion by Mr. Oldberg, seconded by Mr. Whelpley, the Council agreed to request the Association to authorize the publication of the minutes of the joint conference of Boards and Faculties in the A. Ph. A. Proceedings immediately following the minutes of the Section on Education and Legislation.

Discussed by Messrs. Hallberg, Eliel, Beal, Meissner, Godbold, Oldberg, Cliffe.

Moved by Mr. Oldberg, and seconded by Mr. Sheppard, that an additional session of the Section on Education and Legislation be provided for in the program of the annual meetings, to provide time for the proceedings heretofore transacted in the joint meetings of the Boards and Schools of Pharmacy.

Carried.

On motion, the above was referred to the Committee on Reorganization.

Moved by Mr. Beal, and seconded by Mr. Whelpley, that it be the sense of the Council, that the appropriation of \$50.00 for the Historical Section be divided, one half to go to the expenses of the Section and one-half to cover the necessary expenses, clerical and others, incurred by the Historian.

Moved by Mr. Hallberg, and seconded by Mr. Caspari, that the trustees of the Pharmacopoeial Convention be requested to have printed 2,000 pamphlets for preparing the statistics of the Articles of the U. S. P. and N. F.

Moved, that the editor of the "Bulletin" be requested to take charge of the statistical work.

Carried.

On motion the Council adjourned.

On motion of Mr. Main, of New York, the minutes of the Council were adopted as read.

Mr. Whelpley read the minutes of the first session of the new Council, held this day (September 7th) :

FIRST SESSION NEW COUNCIL—SEPTEMBER 7, 1907, 9:30 A. M.

Present: Messrs. Eliel, Hitchcock, Remington, Godbold, Caspari, Whelpley, Searby, Roehrig, Claus, Eberle.

On motion by Mr. Eliel, seconded by Mr. Remington, the Council proceeded to reorganization.

The following were elected :

Chairman—James H. Beal.

Vice-Chairman—A. M. Roehrig.

Secretary—H. M. Whelpley.

On motion of Mr. Eliel, seconded by Mr. Godbold, Jos. P. Remington was granted permission to use the text of the National Formulary in the new edition of Remington's Practice of Pharmacy in the same manner and under the same conditions as it was used in the U. S. Dispensatory.

On motion the Council adjourned.

Mr. Hallberg moved that the minutes of the Council be approved as read, *except* that part which referred to the use of the National Formulary text as published in the present edition of the United States Dispensatory

in the new edition of Mr. Remington's Practice of Pharmacy, and that that matter be referred back to the Council for further consideration. This suggestion at once precipitated a lively discussion, participated in by Messrs. Remington, Hallberg, Main, Sayre, Roehrig, Hynson, Sheppard, Anderson, Mayo, Caspari Jr., and Whelpley, developing considerable difference of view on several points, the net result of which was that the minutes were finally approved as read.

Mr. William C. Alpers was here given the privilege of the floor to make a personal statement, and, prefacing his remarks with the statement that he would rather face the opposition of the entire Association on a professional or trade matter than to say what he was about to say, and which he was only led to say because he thought his duty to himself as well as the reputation of the Association required it, he spoke as follows :

During the last winter a branch of the American Pharmaceutical Association was organized in New York, and I had the honor of being elected the President. At the last meeting of this branch a friend of mine told me that some objections had been raised to my position as President, on account of my attitude toward the physicians of the United States. I was greatly surprised at this statement, and upon further inquiry I learned that a pamphlet had been circulated by a certain committee of the American Medical Association in which I was severely criticised for certain actions of mine. I at once wrote to Chicago for this pamphlet, and received it a few days before this meeting. On page 49 of this pamphlet there appears a clipping from the California Journal of Medicine in which the Alpers Chemical Company is denounced for advertising to the public, and in which I personally also receive my share of their disapproval. I was also told during this week that a similar article had appeared in the Journal of the American Medical Association of which Dr. Simmons is the editor. As a matter of information, I will state that the Alpers Chemical Company does business at No. 4 White street, New York, and prepares a proprietary article called Triacol, which is advertised to physicians only. I personally originated this article, but I have had for years no connection with the company, except that I am a small stockholder and director, and they use my name, I believe, for advertising purposes. The business management is entirely in the hands of the treasurer. In the article referred to a copy of an advertisement in Ainslee's Magazine is given, and it is this advertisement that aroused the disapproval of Dr. Jones, the editor of the California Medical Journal. He speaks of me as a scheming proprietor who has thrown off the mantle of decency, and uses other disparaging language. I at once went down to the office of the Alpers Chemical Company, where I had not been for over a year, and investigated this matter. I found that a contract had been made with the publishing firm of Thompson & Co., and that they had put this and similar advertisements in their magazines. The contract was signed by an employee of the company, who is neither a pharmacist nor a physician, and was not aware that in doing so he acted contrary to the principles of the company. As soon as the error was discovered steps were taken to discontinue the advertisement, and they have long disappeared from the respective journals. This was done before the article in the California Medical Journal had appeared and not in consequence of it. But even if the Alpers Chemical Company had authorized these advertisements in good faith, I would not have known of it, nor could I be held responsible for it, for I have no more influence on the policy of this company than any of you have or than that bottle on the table has. Why Dr. Jones and Dr. Simmons should attack me personally in this

matter, I fail to understand. They certainly know my position as to ethical and professional pharmacy, and could easily have ascertained whether I was connected with this company or not. There exists a proprietary preparation called Simmons' Liver Regulator which is claimed to be good for all ailments. There is also a liniment called Jones' Liniment which is claimed to be a remedy against all external injuries from a cracked skull to a corn. If I should write an article denouncing Doctor Simmons as a scheming proprietor who uses his position to forward the interests of this liver regulator, or if I should write an editorial saying that Doctor Jones has thrown off the mantle of decency, in advertising this liniment to the public, I would certainly be denounced as a reckless and untruthful writer and justly so. Yet Doctor Simmons has as much influence on the policy of Simmons' Liver Regulator and Doctor Jones as much influence on the policy of Jones' Liniment as I have had on the policy of the Alpers Chemical Company.

And these things are done in the name of higher ethics!

What is ethics?

If I understand the word aright, it is the recognition and respect of the rights of others who are engaged with us in the same profession. There is always danger of friction, and ethics will teach us how to avoid such friction, and if friction should exist how to settle the difficulty without resorting to abuse, law or publicity.

The fundamental principle of ethics, therefore, is truth, and no man can claim to be ethical unless he is truthful. But these expounders of higher ethics do not seem to look for truth—they look for sensation. If a scurrilous article is sent to a respectable daily journal, careful investigation as to the truth of all statements is made, and generally a copy of the article is submitted to the person who is attacked with the request to write a reply. This is done because an ethical editor recognizes the power of the press, and his aim is never to injure the innocent or pollute his paper by reckless statements. Should not the editors in Chicago and San Francisco have done the same, especially as they claim to be fighting for higher ethics?

Mr. President, my attitude in this matter is well known. For fifteen years I have stood on the floor of this Association and advocated and fought for higher ethics. I had done so long before the importance of this question dawned upon many of you or on the two men in Chicago and San Francisco. I have again and again risked my popularity in this Association and sometimes stood alone against the storm of misguided opinion, but I have done so with courage because I consider it manlier and worthier of a member of this Association to stand by one's ideals and fight for them, than to cater after popularity. You all know my position in this matter and I regret exceedingly that this work of fifteen years could not have made a deeper impression on those whom I considered to be my friends. When I saw this clipping from the California State Medical Journal the thought passed through my mind: "What will my friends in the American Pharmaceutical Association think of this?" Will they believe it? But only for two seconds this thought occupied me, for I said to myself: Every one of those who have known me for fifteen years know my position and not one of them will believe this. I am sorry that I was mistaken in this thought. I have learned during this week that everyone of you who read this article believed it, that everyone condemned me, that everyone shook his head and said "he has fallen from grace." Thus the loyal and faithful work of fifteen years could be wiped out by the scurrilous attack of a reckless writer in California, and I stand before you defamed in character. This is probably the saddest experience that I have had as a member of this Association and I almost feel that there is no place for me any more on this floor. These two editors have inflicted enormous financial loss on me; for I understand now why a number of the leading New York physicians left my store during the last year without any plausible explanation. They have succeeded in defaming my character before the medical and pharmaceutical

professions. I have no redress, and I look in vain for a motive. But I thought it was my duty to myself and to the reputation of this Association that I should clearly state my position and denounce these articles as far as they relate to myself as utterly false. If these editors are what they claim to be—ethical men—they must give this statement the same publicity as their defaming articles.

The President stated that he had granted the privilege of the floor to Mr. Alpers because he thought the circumstances warranted his making the statement he did. He thought it was wrong for a journal to make an attack upon the reputation of a man of standing without inquiring into the truth of the charges or giving him an opportunity to defend himself. He assured Mr. Alpers, however, that so far as he was concerned he had heard nothing during the week derogatory to his character in any way, shape or form.

Mr. J. F. Hancock, chairman, made verbal report for the Committee on William Procter, Jr., Monument Fund, showing the progress the committee were making in this work. The committee was organized three years ago, and had now a good foundation upon which to build for the future. It was not the expectation of the originator of the movement (the late Albert E. Ebert) that the work could be accomplished in a year, or for that matter in two or three years. It was a work that required a great deal of thought and attention, and could only be successfully done through co-operation. He thought one great work of the committee was the teaching of the younger members of the profession of pharmacy to honor the name and fame of Procter. Mr. Hancock then went on to eulogize Procter in glowing terms as a great light in Pharmacy and as an earnest seeker after truth. He thought the committee should be given the privilege of enlarging itself to whatever extent might be deemed necessary, as it was desired to work systematically throughout the country, and to bring before each individual pharmacist who felt a pride in his profession a sense of his duty to subscribe something, however small, towards the erection of this monument to Procter—which would also be a monument to American pharmacy—in the Smithsonian grounds at Washington. He reported some \$3,500 as being now in the fund, and proposed that it be turned over to the Association for investment that the fund might have the benefit of the accruing interest from year to year.

Mr. Henry Kraemer, secretary of the committee, then offered the following report, calling particular attention to the recommendation that the committee each year should turn over to the Association at its annual meeting the funds collected during the year, to the end that they might be properly invested.

REPORT OF COMMITTEE ON WM. PROCTOR, JR., MONUMENT FUND.

Your Committee report that the paid and pledged subscriptions thus far received amount to \$3,475.78.

During the years that the committee has been in existence it has been impossible for

some of the members to put forth as great efforts as was desirable, but it is hoped that the work can be taken up more systematically another year.

The subscriptions thus far collected amount to \$1224.20 as follows:

Minnesota Pharmaceutical Association	\$100 00	Florence Yapple.....	5 00
Maryland Pharmaceutical Association	100 00	J. C. Peacock	5 00
New York Pharmaceutical Association	50 00	Ambrose Hunsberger	5 00
Tennessee Pharmaceutical Association	10 00	O. W. Osterlund	5 00
Through Special Committee N. Y. Ph. Assoc., names of subscribers not given	218 20	Wm. M. Morrison	5 00
Through C. S. N. Hallberg, names of subscribers not given	187 50	Louis Emanuel.....	5 00
John Attfield.....	25 00	W. H. Smith & Co.....	5 00
John U. Lloyd	25 00	H. E. Peters.....	5 00
J. B. Moore.....	25 00	Edwin L. Newcomb	5 00
Louis Dohme	25 00	J. H. Stein	5 00
Chas. E. Dohme	25 00	Henry P. Thorne	5 00
Muth Bros. & Co.....	25 00	M. I. Wilbert	5 00
Emerson Drug Co.....	25 00	S. E. R. Hassinger.....	5 00
Chas. Caspari, Jr.....	20 00	John F. Patton	5 00
Adolph W. Miller	15 00	David Horn	5 00
Richard M. Shoemaker.....	15 00	George A. Gorgas	5 00
Henry Kraemer	10 00	C. A. Weidemann	5 00
Jas. T. Shinn	10 00	Franklin M. Apple.....	5 00
Chas. W. Hancock	10 00	L. L. Walton	5 00
Saml. P. Sadtler.....	10 00	Wm. J. Miller.....	3 00
Edward H. Hance.....	10 00	E. W. Garber	3 00
Frank X. Moerk	10 00	Chas. B. Fricke	3 00
Frank E. Morgan	10 00	F. F. Muller	2 50
Wm. McPike	10 00	Lorne E. Hastings.....	2 00
Henry J. Siegfried.....	10 00	Geo. W. Roland	2 00
William McIntyre	10 00	J. M. Graves	2 00
Chas. T. George.....	10 00	J. W. Worthington	2 00
D. J. Thomas	10 00	Harry Matusow	2 00
Jacob A. Miller	5 00	Oscar Riedstrom.....	2 00
J. P. Reymond	5 00	Jacob Diner	2 00
Richard H. Lackey	5 00	F. A. Russell.....	2 00
Edwin M. Boring	5 00	George Kleinau	2 00
Henry H. Rusby	5 00	A. B. Husted	1 00
George Hahn.....	5 00	Chas. L. Gesell	1 00
C. L. McBride	5 00	Oscar Kleine.....	1 00
Benjamin Rosenberg.....	5 00	Isaiah Lewin.....	1 00
H. H. Blomeier	5 00	Mrs. Horace Lee	1 00
W. T. Cregan	5 00	Miss M. A. Moffet	1 00
Otto Wicke	5 00	W. J. Stoner	1 00
Wolf Bros.	5 00	Wm. O. Frailey	1 00
J. Edwin Hengst	5 00	John K. Garland	1 00
		J. W. Westcott	1 00
		Robt. S. McKinney	1 00
		Henry Howard.....	1 00
		E. F. Kelly	1 00
		P. C. Heusler	1 00
		J. C. Muth.....	1 00
		M. F. Carnes	1 00

J. P. Keating	1 00	Owen C. Smith.	1 00
J. F. Leary	1 00	Geo. I. Way	1 00
G. C. Wisotzki	1 00	D. R. Millard	1 00
H. Lionel Meredith	1 00		
A. E. DeReeves	1 00		
			<u>\$1224 20</u>

The following expenses have been incurred:

For printing circulars	\$20 12
For postage	16 00
For addressing envelopes	1 75
For folding and addressing circulars	5 00
	<u>42 87</u>
	\$1181 33
To which must be added interest	65
	<u>\$1181 98</u>
Leaving on hand a cash balance of	

PLEGDED SUBSCRIPTIONS.

The following is a list of the pledged subscriptions received by Henry Kraemer:

Joseph P. Remington	\$100 00	Smith, Kline & French Co.	50 00
William R. Warner, Jr.	50 00	Joseph L. Lemberger	10 00
M. N. Kline	25 00	Clement B. Lowe	10 00
Frederic E. Niece	5 00	William E. Lee	5 00
W. L. Cliffe	10 00	Charles E. Vanderkleed	2 00
Henry C. Blair	5 00	L. E. Sayre	2 00
Joseph A. Heintzelman	10 00		
Evan T. Ellis	10 00	Total	<u>\$294 00</u>

Through Prof. Joseph P. Remington the late John Wyeth, his brother Frank and the firm of John Wyeth & Brother pledged \$2,000 to the fund.

Finally, the committee desire to say that inasmuch as it will require a number of years, or at least several years, to collect the funds necessary to erect a monument such as is contemplated, we recommend that the Committee on Procter Monument hand over to the Association each year at the annual meeting the funds collected, in connection with the report of the committee, which fund should be set aside and known as the Procter Monument Fund.

J. F. HANCOCK, *Chairman.*
HENRY KRAEMER,
LEWIS C. HOPP.

September 2, 1907.

On motion of Mr. Roehrig, seconded by Messrs. Sayre and Claus, the report of the Committee on Procter Monument Fund was accepted, and the committee was authorized to enlarge itself as necessity might dictate.

On motion of Mr. Sheppard, seconded by Mr. Eberle, the Association was authorized to accept the trust proposed, and to receive and invest this fund as accumulated from time to time, and the Finance Committee was instructed to properly invest the money as received according to their best judgment.

Mr. Hallberg, chairman of the committee, then read the report of the Committee on Reorganization, a verbal forecast of which was made at the second general session.

REPORT OF THE COMMITTEE ON REORGANIZATION.

The Committee begs to report the following draft of the changes and additions to the constitution of the American Pharmaceutical Association.

Article 1. To remain as at present.

Article 2. To remain as at present.

Article 3. There shall be an administrative body known as the Council of the American Pharmaceutical Association. It shall be composed of delegates representing local branches, the State Pharmaceutical Associations, and the several Sections of this Association as hereinafter provided for in the By-Laws. It shall represent the delegated power of the Association. It shall elect the general officers of the Association and a board of six trustees, and shall transact all the general business of the Association of a public, professional, scientific or other character that is not otherwise provided for. The trustees shall be members of the Council without the right to vote.

Article 4. The officers of the Association shall be an Honorary President, a President, three Vice-Presidents, a General Secretary, a Treasurer, a Reporter on the Progress of Pharmacy, an editor and Local Secretary, all of whom shall be elected annually by the Council. They shall hold office until their successors are elected.

Article 5. Board of Trustees. The Board of Trustees shall have charge of the property and of the financial affairs of the Association. Two trustees shall be elected annually by the Council, each to serve for a period of three years. The President shall be a member of the Board of Trustees, and the General Secretary and Treasurer shall be members of the Board of Trustees without the right to vote.

Article 4, change to Article 6.

Article 5, change to Article 7.

Respectfully submitted,

M. I. WILBERT,
C. S. N. HALLBERG.
CASWELL A. MAYO.

Mr. Roehrig asked the question if he understood aright that these proposed changes eliminated the President and other officers from the Council, but Mr. Mayo suggested that one reason for providing for some time to elapse before passing upon the proposed changes was to provide ample opportunity for discussion and consideration thereof, and he thought it undesirable to precipitate discussion at this time. He said all the pharmaceutical journals would publish the report, and there would be full opportunity for suggesting any desired change before the matter came up for final disposition next year. The Chair agreed that this suggestion was a good one, and Mr. Roehrig did not press his inquiry.

Thereupon the Chair put the vote on the reception of the report and making it a part of the records, and the motion prevailed.

Mr. Hynson, of Baltimore, submitted in writing for consideration and adoption at the next annual meeting of this Association certain amendments to the Constitution and By-Laws, as follows :

I most respectfully propose that the American Pharmaceutical Association, at its next annual meeting, shall alter and amend its form of organization and Constitution as follows :

1. Re-adopt and restore to former place, under the heading, "Constitution and By-Laws of the American Pharmaceutical Association," the entire original "Preamble," as

adopted and heartily endorsed by the revered founders of this Association at its first meeting in 1852.

2. Strike out all the articles now appearing under the sub-heading "Constitution," from Article I to Article V inclusive, and substitute for them Article I of the original Constitution of this Association and six other articles to be known as Articles II, III, IV, V, VI and VII, which, together, and preceded by the "Preamble," shall read as follows:

PREAMBLE.

WHEREAS, The advancement of pharmaceutical knowledge and the elevation of the professional character of apothecaries and druggists throughout the United States are dear to us in common with all well-disposed pharmacists; and

Whereas, A large portion of those in whose hands the practice of pharmacy now exists, are not properly qualified for the responsible offices it involves, chiefly by reason of the many difficulties that impede the acquirement of a correct knowledge of their business.

Therefore, We, the members of a convention now met at Philadelphia (September, 1852), composed of apothecaries and druggists from different sections of the union, and from all the colleges and societies therein existing, with the object of deliberating on the condition of our profession, do hereby resolve and constitute ourselves into a permanent Association, to meet annually, at such times and places as may hereafter be determined, for more effectually accomplishing the objects for which we are now assembled, and do now adopt the following:

CONSTITUTION.

ARTICLE I. *Name, Aims and Objects.*

This Association shall be called the American Pharmaceutical Association. Its aim shall be to unite the educated and reputable pharmacutists and druggists of the United States in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulteration.
2. To establish the relations between druggists, pharmacutists, physicians and the people at large, upon just principles, which shall promote the public welfare and tend to mutual strength and advantage.
3. To improve the science and the art of pharmacy by diffusing scientific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.
4. To regulate the system of apprenticeship and employment so as to prevent as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.
5. To suppress empiricism, and as much as possible restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

ARTICLE II. *Composition.*

The "Association" as provided for in the Preamble and as named in Article I, shall be composed of two principal parts, namely: The "General Association," and the "Council." The General Association shall be divided into "Sections" and from the membership of the Council shall be formed a "Board of Trustees."

ARTICLE III. *Membership.*

The General Association may include regular, life, and honorary members. The Council may include ex-officio, elected, and delegate members, all of whom must have

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2. Strike out all the articles now appearing under the sub-heading "Constitution," from Article I to Article V inclusive, and substitute for them Article I of the original Constitution of this Association and six other articles to be known as Articles II, III, IV, V, VI and VII, which, together, and preceded by the "Preamble," shall read as follows:

PREAMBLE.

WHEREAS, The advancement of pharmaceutical knowledge and the elevation of the professional character of apothecaries and druggists throughout the United States are dear to us in common with all well-disposed pharmacists; and

Whereas, A large portion of those in whose hands the practice of pharmacy now exists, are not properly qualified for the responsible offices it involves, chiefly by reason of the many difficulties that impede the acquirement of a correct knowledge of their business.

Therefore, We, the members of a convention now met at Philadelphia (September, 1852), composed of apothecaries and druggists from different sections of the union, and from all the colleges and societies therein existing, with the object of deliberating on the condition of our profession, do hereby resolve and constitute ourselves into a permanent Association, to meet annually, at such times and places as may hereafter be determined, for more effectually accomplishing the objects for which we are now assembled, and do now adopt the following:

CONSTITUTION.

ARTICLE I. *Name, Aims and Objects.*

This Association shall be called the American Pharmaceutical Association. Its aim shall be to unite the educated and reputable pharmacutists and druggists of the United States in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulteration.

2. To establish the relations between druggists, pharmacutists, physicians and the people at large, upon just principles, which shall promote the public welfare and tend to mutual strength and advantage.

3. To improve the science and the art of pharmacy by diffusing scientific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging the production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and to prevent as far as practicable, the evils flowing from deficiencies in the studies of preparing, dispensing and selling medicines.

5. To suppress empiricism, and as far as possible, to regulate the purchase and sale of medicines to regularly educated druggists.

The "Association" as provided in Article I, shall be composed of two principal bodies, to-wit: the "Council," The General membership of the Council shall consist of all members of the Association.

The General Association shall be composed of all members of the Association. The Council may include such members as it may deem fit to have.

been members of the Association, in good standing, for three years and shall be known as "Councilors."

ARTICLE IV. *Officers.*

The officers of the Association shall be a President, First-Vice President and Second Vice-President, who shall be elected annually by the General Association; a Chief Councilor, General Secretary, Treasurer, Reporter on the Progress of Pharmacy, Journal Editor and Local Secretary, who shall be elected annually by the Council.

ARTICLE V. *Funds.*

All permanent and special funds, including those derived from life membership and such as may be bequeathed to the Association or otherwise donated to it, shall be invested by the Treasurer in such securities as may be approved by the Board of Trustees. The interest only of the current year from such funds may be used for defraying the expenses of the Association for that year.

ARTICLE VI. *By-Laws.*

By-Laws for the regulation of the General Association as well as for the government of the Council and the Board of Trustees, shall be enacted by the General Association in regular session, and no change in such By-Laws may be made unless notice of the proposed change has been given at the session immediately preceding the one at which the motion to amend is made. No such motion shall be considered carried unless two-thirds of all the votes cast shall have been favorable to it.

ARTICLE VII. *Amendments.*

Amendments and alterations to the Preamble or Constitution may be made at any annual meeting, provided notice of the proposed change has been given at the annual meeting immediately preceding the one at which the motion to amend is made. Such motion must receive three-fourths of all the votes cast before it may be considered as having carried.

HENRY P. HYNSON.

The report of the Committee on Publicity was again called for, and Mr. Mayo stated that the chairman, Mr. Gane, was unavoidably absent and had asked him to report at the second general session, but he was not in the room when the report was asked for. He said the committee simply desired to report progress. The newspaper attitude towards pharmacists and their associations had not been as favorable in the past few years as could be desired, but the committee had been able recently to do some good work with the New York Saturday and Sunday papers that had caused them to speak of this Association in a more favorable light.

Mr. Hays presented the report of the Reporter to the Public Press as follows, stating that several times during the meeting the members had asked him why the New York daily papers had not been more generous in the matter of space to the work of the Association and its various sections, and this report would in a measure answer that question.

REPORT OF THE REPORTER TO THE PUBLIC PRESS.

To the Members of the American Pharmaceutical Association :

In pursuance of his duties as Reporter to the Public Press, the undersigned wrote to fifteen or twenty of the leading daily papers of this city in the latter part of August, inviting and requesting them to be represented at our meetings of this week, and offering to give

each of them a special "story" setting forth some of the purposes and accomplishments of the Association. He also wrote to the Associated Press, the New York City News Bureau, *Collier's Weekly*, and a personal letter to Mr. Melville E. Stone, New York manager of the Associated Press. Two replies were received, one from *Collier's Weekly*, thanking him for the kind invitation and the clippings sent, and saying that the matter had been referred to Mr. Samuel Hopkins Adams; and one from Mr. Stone, in which he said he had given instructions which he hoped would result in a satisfactory report. Mr. Stone added: "Although, as I explained to you, I think a great many things which would be of interest to the participants in the meeting would not be of general news value."

One paper, the *Journal of Commerce*, accepted your Reporter's offer of a special "story," and sent a representative to him for it; the same paper had a reporter present at our first day's meeting, but evidently its managing editor had work for him which he considered more important, as he did not return. The Associated Press did somewhat better, as it sent a reporter to cover the meetings for both city and out-of-town papers, and this young man, I believe, returned for a second day's work with us.

Some of the city dailies have given us an average of a couple of inches or so a day, and some have ignored our presence. What our city editors consider matters of news value may be learned by those who daily scan columns of accounts of the doings of burglars, highwaymen, chauffeurs, and the common or garden variety of murderers, pickpockets, and other members of the under world, as gathered from the police-court blotters, as well as the scandals in high and low life brought out in the civil courts. When the schoolmates of little Bennie Cohn, of Orange, N. J., adopt resolutions calling upon Papa Cohn to put Bennie Cohn in "long pants," a full account of the proceedings day after day with a copy of the resolutions (which are larger than Bennie's "knickers"), appears in the papers; but when the American Pharmaceutical Association adopts resolutions which mean better health and longer life for millions of American citizens, no cognizance is taken of the fact by our great editors.

The best account of what our Association is and is doing which your Reporter was able to get into a daily paper appeared in the "Tip of the Tongue" column of the *New York Press* for last Sunday, this column being presided over by a personal friend of the Reporter. Mr. Caswell A. Mayo, a member of our Committee on Publicity, also has some personal acquaintances among the daily newspaper men, and your Reporter acknowledges his own and the Association's obligations to him and to Dr. W. C. Alpers for securing the publication of articles about our work in the *New York Times*, the *New York Tribune*, and the *Staats Zeitung* of last Sunday.

In conclusion your Reporter wishes to say that he hopes to have time to send to some two or three hundred medical journals such accounts of our meeting as will impress doctors who read it with the fact that druggists who are members of the American Pharmaceutical Association are the ones to whom they should entrust the filling of their prescriptions.

Respectfully submitted,

FRANCIS B. HAYS,

Reporter to the Public Press.

New York, Sept. 7, 1907.

On motion of Mr. Whelpley, seconded by Mr. Roehrig, the report was ordered to be received, with the thanks of the Association to Mr. Hays for his careful work in discharging the duties of his office.

A report from the Committee on Ebert Resolutions was called for, but the chairman (Mr. Searby) had unfortunately mislaid the resolutions drafted, and the president asked that the committee report to the Council at its meeting at three o'clock this afternoon.

Mr. Hallberg called the attention of the members present to the fact that he had with him some seventy-five copies of the Ebert memorial volume for distribution, and suggested that upon adjournment the members come forward and secure them, leaving their cards, so that duplicate copies might not be sent them hereafter.

The General Secretary said he desired to present here a few resolutions offered by Mr. McElhenie, of Brooklyn, which he had been trying to get before the Association ever since Tuesday morning. He then read the following :

WHEREAS, The American Medical Association, the American Pharmaceutical Association and the National Association of Retail Druggists, together with many state and local organizations and journals in both professions, have been for some time endeavoring to bring about a return to the practice of medicine based on the Pharmacopœia, and

Whereas, The medical colleges are represented on the Committee of Revision of the U. S. Pharmacopœia, and

Whereas, It is manifest to the thoughtful men both in medicine and pharmacy that a very large number of medical men might be better informed regarding the Pharmacopœia as a book of reference and standards. Be it therefore

Resolved, That it is the sense of the American Pharmaceutical Association in convention assembled, that a great advance in the ethical practice of medicine and pharmacy will be made when the medical colleges make the Pharmacopœia a prescribed text-book or book of reference and require a familiarity with it in their examinations.

Resolved, That we request the governing authorities of all medical colleges in the United States to put into force such a ruling in their respective institutions as will insure in future classes a well-grounded knowledge of Materia Medica and Pharmacognosy, as set forth in the Pharmacopœia.

Resolved, That the General Secretary be directed to transmit a copy of these resolutions to each medical college in the United States and to the medical and pharmaceutical press.

Mr. Remington moved the adoption of the resolutions.

The General Secretary suggested that this would seem to carry with it the requirement that the General Secretary send notification to all medical colleges and medical and pharmaceutical journals of the request.

The Chair thereupon put the vote upon the adoption of the resolution, and it carried.

The General Secretary reported that every resolution and report of the committees that had come to his hands had been brought before the Association, and that there was no deferred business that he had any knowledge of.

President Eliel thereupon announced that it now devolved upon him to lay down the gavel and insignia of office. Before doing so, however, he desired to thank the members of the Association for the great honor conferred on him, and for the kind manner in which they had borne with him in presiding over their deliberations.

The President then called upon Mr. Lemberger, of Pennsylvania, to escort the President-elect to the platform that he might be duly inducted

into office. Mr. Lemberger discharged the duty assigned him in his usual happy style, and President Eliel congratulated Mr. Searby upon his succession to the office of President, and assured him of his great pleasure in being succeeded by a gentleman of such merit and distinction. He then introduced Mr. Searby to the members as their new President, elected to serve for the ensuing year. Mr. Eliel then proceeded to pin upon the lapel of Mr. Searby's coat the President's badge, insignia of his office—an office the highest in the gift of American pharmacy—and said he felt sure that he would be a faithful, efficient and in every way satisfactory official. He bespoke for the new President the same pleasant experience, the same kind assistance, that he himself had been accorded during his term of official service.

Mr. Searby acknowledged the honor done him in excellent good temper. He said that when he left San Francisco he hadn't any idea what a good man he was (laughter), and that when Mr. Roehrig, in the Committee on Nominations got up to nominate a candidate for President, and described the man he had in his mind's eye as a wonderfully good man and all that, he thought of Rusby and Remington and Oldberg, and such lights in pharmacy, but never once did he think of himself, and he was accordingly very greatly surprised when Mr. Roehrig mentioned his name. To illustrate his position of childlike innocence in this matter, he told an amusing anecdote of a little Sunday-school boy who, when his teacher was trying to get from his class an answer to the question as to who it was that led the Children of Israel into the Promised Land, finally summoned the courage to respond, "Please, sir, it was not me, sir; I haven't been here but three weeks, and I come from Missouri." (Laughter and applause.) Mr. Searby thanked the members heartily for the honor conferred, and said he was deeply impressed with the responsibility involved, but he would not state his ambitions, nor would he say what he proposed to do during the coming year, preferring rather to await the close of his term of office and let his acts speak for themselves. He did say, however, that he regarded the coming year as a somewhat critical one, in view of the present relation of the pharmacists and the medical profession: right action at this time would bring about better relations, while a wrong course would be particularly injurious. Legislative matters needed the best attention and most careful consideration, while the rather chaotic condition of educational affairs called for all the wisdom that this Association and the trustees of the colleges and regents of the universities could bring to bear upon this vexed problem. These questions should be met fairly and squarely, without dodging them, and with the greatest care and wisdom possible to command. Mr. Searby concluded by pledging his best efforts to the work before him. (Applause.)

President Searby took the chair.

The General Secretary reported that the First and Second Vice-

Presidents-elect, Messrs. H. H. Rusby and Oscar Oldberg, were not in the room, but that Mr. O. W. Bethea, of Mississippi, the Third Vice-President, was present. Thereupon the Chair appointed Mr. Whelpley to conduct Mr. Bethea to the rostrum. Mr. Whelpley performed this pleasant duty, and introduced Mr. Bethea as a particularly fortunate man, saying that only last week he had led to the altar a charming life-partner (now gracing this meeting with her presence), and this week he had come into the Third Vice-Presidency of the Association. (Applause.)

Mr. Bethea expressed his high appreciation of the honor conferred upon him, but said that he felt, in view of the splendid array of senior officers chosen, that very little of real responsibility would devolve upon him. He hoped to have the undiminished respect of the members at the end of his term of office.

The General Secretary said the next installation called for a sort of "geometric process to determine the value of a triangle." He referred to the custom of installing the Treasurer, General Secretary and Reporter on the Progress of Pharmacy at one and the same time. However, Mr. Diehl, who had been elected to the latter office, was sick and could not be present on this occasion. The Chair thereupon requested Mr. Main to escort the General Secretary and the Treasurer to the stand and introduce them. These gentlemen were greeted with applause as they came forward, and Mr. Main said he took great pleasure in introducing these "young and untried gentlemen" to the Association, adding that they had filled their offices so long and so well that no one would think of electing anybody else.

Mr. Sheppard spoke first and thanked the members from the bottom of his heart for this renewed evidence of their confidence and partiality in again electing him Treasurer of the Association. He especially appreciated it, as it was the last time he would be installed as Treasurer, having fully resolved, as he had previously stated, to surrender this office to another and a younger man, conceiving it to be a matter of duty on account of his advancing years. He said it was one of the hardest things he had ever done in his life to make up his mind to do this, but he was convinced it was right; he had thought it over for several years, and had absolutely decided on this course last winter.

Mr. Sheppard then referred to a touching letter he had received during this meeting from the widow of a former President of the Association—Emlen Painter, of California—who unfortunately died before entering upon the active discharge of the duties of the office, and quoted the following extract from the letter, showing the continued love and respect this estimable woman had for the Association, even after so long a time had elapsed since her husband's connection with it:

My Dear Mr. Sheppard:

Though my interest in the American Pharmaceutical Association has never flagged,

for the past eighteen years I have heard nothing of its proceedings. But recently I chanced to see a copy of the *Druggists' Circular*, in which mention was made of an endeavor to raise money for a permanent endowment fund: and realizing Mr. Painter's deep interest in the Association, and how heartily he would be in accord with the plan, I feel that in memory of him I want to contribute my mite to that fund. Would that I were able to make it ten times the amount.

Mr. Sheppard also stated that Mr. W. O. Allison, of the *Druggists' Circular*, had sent his check for \$250.00, and had asked him to "call again:" also that Mr. Frank Ryan, of Detroit, had sent his personal check for \$250. He also stated that Professor Oldberg, of Chicago, had pledged \$100.00 in five payment of \$20.00 each. Mr. Whelpley, of St. Louis, had likewise given his check for \$25.00. Besides these handsome donations, there were quite a number of smaller ones from different members. Mr. Sheppard stated that he had also received from Mr. Ewen McIntyre, of New York, a check for \$125.00 for a life-membership for himself and son. These statements were received with applause on the part of the members. Mr. Runyon said he thought the Association should take some official recognition of the communication and donation from Mrs. Painter, the widow of an ex-president of the Association, and moved that the thanks of the Association be extended to her for her kind letter and generous contribution.

This motion was seconded by Mr. Remington.

Mr. Searby said he was very much touched when he read this letter of Mrs. Painter to the Treasurer. He well knew how intensely interested Professor Painter was in this Association for many years, and he could well understand how his widow should know that his whole interest would be wrapped up in the Association at this time if he had been alive. He therefore thought it particularly appropriate that the Association should take recognition of this donation.

Thereupon the vote was put upon Mr. Runyon's motion, and it carried unanimously.

Mr. Charles Caspari, Jr., then proceeded to express his grateful appreciation of the continued confidence and esteem of his fellow-members in again electing him to the office of General-Secretary, which he had now filled for thirteen years. There was a tinge of sadness to the occasion, however, in the illness of his associate, Professor Diehl, and because of the announced determination of Mr. Sheppard to retire from office at the expiration of another year. His relations with Mr. Sheppard had been particularly intimate during his official life, and had always been of the most cordial and friendly character. No two men, he felt sure, could have worked together more harmoniously than they have done, and when he learned that Mr. Sheppard intended to retire from office he felt as if he were going to lose the best friend he had in the world. He was hopeful that Mr. Sheppard might yet consent to a re-election to office next year.

His acquaintance with the affairs of the Association were of such a nature that it would be very difficult indeed to fill his place. Mr. Caspari said he did not mean to eulogize Mr. Sheppard, because he needed no eulogy from him, but it was with a note of sadness and regret that he contemplated that this was probably the last time they would be installed together.

Mr. Hallberg suggested in this connection that it would seem to be appropriate under the circumstances to send a word of greeting to the third member of the trio, who was confined to a sickbed and was not able to be present. The General Secretary suggested that this had been done early in the week, in compliance with a resolution adopted by the Association at its first session, but that Professor Diehl was now happily reported to be much better, and he thought it would be entirely proper to send a telegram of congratulation upon his recovery. Mr. Hallberg accepted this suggestion, and Mr. Anderson seconded the motion, and it was unanimously adopted.

The Chair appointed Mr. Roehrig to conduct the three members of the Council-elect to the rostrum to be installed. Mr. Godbold, of New Orleans, was not present, but Mr. Roehrig brought forward and introduced Messrs. Leo Eliel, of Indiana, and E. G. Eberle, of Texas, the other two members-elect.

Ex-President Eliel contented himself with a simple expression of his thanks for this renewed evidence of confidence on the part of the Association, and said he would try to do his duty in the Council, as he had in the past in other positions of trust.

Mr. Eberle also begged to thank the members, and said he would endeavor to serve them to the best of his ability.

The General Secretary reported that there was no further business before the Association that he had any knowledge of, except a matter that the Treasurer desired to bring up. Thereupon Mr. Sheppard stated that he had been asked to do the most pleasant thing possible for one to do at an annual meeting, viz., to express the thanks of the Association to its hosts. He therefore moved the adoption of the following resolution :

WHEREAS, The Fifty-fifth Annual Meeting of the American Pharmaceutical Association held in the City of New York, is about to bring its proceedings to a close; and,

Whereas, The Association has been most bountifully provided for at the Hotel Astor, with its magnificent appointments both for the general business of the Association and for its various offices; and,

Whereas, The Association has been provided with entertainments and diversions of a high order; therefore, be it

Resolved, That we appreciate most fully the difficulties that beset the Committee of Arrangements, among whom we would mention especially, Thomas P. Cook, Chairman, in making provision for our accommodation in a city so large as New York, and we bear our tribute of praise and thanks to those gentlemen for the completeness and excellence of all their arrangements.

Resolved, That we tender to the Committee of Arrangements, pharmacists and druggists of Greater New York our most hearty thanks for all their attentions to the convenience, comfort and enjoyment of the delegates to the Association.

Mr. Bond, of Arkansas, and Mr. Payne, of Georgia, seconded the motion to adopt the resolutions, and they were adopted by unanimous rising vote.

Mr. Roehrig announced that the new Council would meet at three o'clock this afternoon, and requested a full and prompt attendance, as the new members of the Council were to be installed, and there was other business to be attended to.

Mr. Searby announced the appointment of the following delegations :

Delegates to the National Association of Retail Druggists: Messrs. F. W. Meissner, of La Porte, Ind.; Joseph P. Remington, of Philadelphia; L. C. Hopp, of Cleveland; William C. Anderson, of Brooklyn; William Bodemann, of Chicago.

Delegates to the National Wholesale Druggists' Association: Caswell A. Mayo, of New York; W. A. Hover, of Denver; Thomas F. Main, of New York; Theodore F. Meyer, of St. Louis; Cornelius Van Schaack, of Chicago.

Mr. Bond, as the representative of the State of Arkansas, gave a hearty invitation on behalf of the druggists and people of Arkansas to all to be present at the meeting at Hot Springs next year. He promised a big time down there, and said that while they had no Coney Island or Hotel Astor, they had plenty of hot water and, and plenty of "ginger" to go with it, and that there was no reason for anybody to emulate the prayer of the little girl in Boston who bade the Lord good-bye one night, saying that she was going to Arkansas in the morning?

The President asked if there was any further business to come before the Association.

Thereupon Mr. Searby declared the Fifty-fifth Annual Meeting of the American Pharmaceutical Association adjourned *sine die*.

After adjournment of the Association, the Council held another meeting, as follows :

SECOND SESSION OF THE COUNCIL—SEPTEMBER 7, 1907, 3:00 P. M.

Vice-Chairman Roehrig in the Chair.

Present: Messrs. Roehrig, Eberle, Whelpley, Caspari, Searby, Remington, Lemberger, Claus, Hitchcock, Bethea.

The following was submitted and approved :

WHEREAS, This Association has, during the past year, suffered a severe loss in the death of one of its oldest and most devoted members, Albert E. Ebert; therefore be it

Resolved, That we desire to place on record our expression of appreciation, esteem and affection for our departed friend and co-worker.

Resolved, That we bear testimony to his great ability, energy and unselfish devotion to the interests of pharmacy.

Resolved, That we mourn his death as the loss of a warm friend, an earnest worker in all affairs that make for the welfare of pharmacists, whether commercial, educational or scientific.

W. M. SEARBY,
OTTO F. CLAUS,
HARRY B. MASON,
Committee.

Mr. F. B. Hays was present by request and spoke of the desirability of having a small committee to take final and definite action in regard to the program for the 1908 meeting.

On motion by Mr. Remington, seconded by Mr. Hitchcock, no change is to be made in the program for the annual meeting unless received more than one month before the meeting.

On motion by Mr. Whelpley, seconded by Mr. Claus, the Secretary of the Section on Education and Legislation was requested to cordially invite the members of the Boards of Pharmacy and the Pharmaceutical Faculties to attend especially the third session of that Section.

On motion of Mr. Whelpley, seconded by Mr. Eberle, applicants Nos. 343 to 350 inclusive were elected to membership.

On motion the Chairman was requested to nominate the Committees of the Council and submit the names for approval.

On motion of Mr. Lemberger, seconded by Mr. Eberle, the Council adjourned subject to the call of the Chair.

MINUTES

OF THE

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

FIRST SESSION—TUESDAY AFTERNOON, SEPTEMBER 3, 1907.

The Section on Practical Pharmacy and Dispensing was called to order at 3 : 20 p. m. by Chairman H. A. B. Dunning, of Baltimore. There were also present of the Committee Secretary Joseph Weinstein, of New York, and associate F. M. Apple, of Philadelphia.

The Chairman asked Mr. Apple to take the chair while he read his address, which here follows :

CHAIRMAN'S ADDRESS.

In casting about for a subject that might prove both interesting and helpful to the Association, I struck the idea that my experience in what is generally understood to be the more scientific fields of pharmaceutical work, although limited, in connection with my more extensive work along strictly pharmaceutical lines might enable me to offer suggestions as to how the Sections on Scientific Papers and on Practical Pharmacy and Dispensing might be of greater service to each other and most effective in their work of increasing the general competency of the retail pharmacist.

While holding this line of thought I have studied, carefully, the published proceedings of both these Sections for the last five years.

This study leads me to the conclusion that the two Sections have not been in close touch, the one with the other.

While the work of the Section on Scientific Papers has been of a high order, such as can but cause the members of this Association to be very proud, yet, with the exception of efforts toward the improvement of methods of assay and analysis, and the various plans offered for the purpose of discovering impurities or adulterations in drugs, there is comparatively little to directly benefit the retail pharmacist.

I do not wish it to be understood that I advocate the slightest cessation of the highly scientific investigations which have heretofore been carried on by members interested in the older Section, but do suggest that there are an infinite number of problems of the highest interest and which might be considered to the practical advantage of the dispensing pharmacist; they are such as might be carried to a certain point in this Section and then turned over to the Section on Scientific Papers, in good shape, for their more exhaustive treatment.

I say "in good shape;" I mean by this that the practical pharmacist, after observing phenomena that are unusual and interesting, should make careful observation of all points bearing on the problem and work the matter, if possible, to a successful pharmaceutical conclusion and if, as is often the case, results are secured from empirical methods, finally submit it to our more scientifically trained men for logical explanation.

To illustrate my meaning I will offer several examples of the class of problems I have in mind and will also outline how I think they should be investigated by the practicing pharmacist, and at what point the work should be referred to the Scientific Section.

For several years I have given some thought to the interesting question of why equal weights of different chemicals increase in volume unequally when dissolved in water. Five grams of potassium iodide dissolved in 20 Cc. of water will cause the volume to be increased to 21.4 Cc., five grams sodium bromide to 21.6 Cc., five grams silver nitrate to 20.9 Cc., showing an increase in volume of 1.4, 1.6, .9 Cc. respectively. A little thought will lead one to conclude that the lower molecular weight of the compound the greater the increase in volume should be, for according to the accepted theory there should be more molecules in 5 Gm. of sodium bromide, mol. weight, 103, than in the same weight of potassium bromide, mol. weight, 119. Perhaps the dissociation theory will come into play and will complicate speculation to a still greater degree. However, in a general way the first theory is borne out by the following table:

	M. W.	I. V.	
5 Gm. LiCl	42	2.9	
5 Gm. NaCl	58	1.75	
5 Gm. LiNO ₃	69		
5 Gm. KCl	74	2.0	
5 Gm. NaNO ₃	84	1.9	
5 Gm. LiBr	86	2.1	
5 Gm. KNO ₃	100	2.1	
5 Gm. NaBr	102	1.6	
5 Gm. Li ₂ SO ₄	110		
5 Gm. KBr	118	1.55	
5 Gm. LiI	133	2.4	
5 Gm. Na ₂ SO ₄	140	1.0	
5 Gm. NaI	148	1.3	
5 Gm. FeSO ₄	151	1.375	
5 Gm. KI	164	1.4	
5 Gm. AgNO ₃	168	.9	
5 Gm. K ₂ SO ₄	173	1.0	
			W. C.
5 Gm. Na ₂ SO ₄ ·10H ₂ O	319	3.1 — .44 = 2.66	2.8 Gm.
5 Gm. Na ₂ SO ₄ dried .....		.95	
5 Gm. FeSO ₄ ·7H ₂ O	277	2.4 — .75 = 1.66	2.3
5 Gm. Na ₂ HPO ₄ ·10H ₂ O	355	3.1 — .58 = 2.6	3
5 Gm. Na ₂ HPO ₄ dried	140	1.45	

There are several interesting points regarding the results shown by this table. The chemicals are arranged according to their molecular weights, and it may be observed that LiCl, with the lowest molecular weight, increases the volume the most, while K₂SO₄ and AgNO₃, having the highest molecular weights, increase the volume least. The intermediate members do not follow the rule perfectly, yet in a general way they do.

Another interesting point is that salts containing water of crystallization increase the volume out of all proportion to their molecular weight.

When the increase of volume caused by the dried salt and the crystallized salt of the same compound is compared, it will be observed that the water of crystallization apparently increases the volume in direct proportion to the amount present in the salt. That is, 5 Gm. $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ increases the volume 3.1 Cc. As the amount of the dried salt present in 5 Gm. only increases the volume .44 Cc., the balance of increase, 2.66 Cc., is due to water of crystallization, 5 Gm. of the crystallized salt containing 2.8 Gm. water of crystallization, results nearly agree. Sodium phosphate illustrates an additional case quite nicely.

Now as a trained, practical pharmacist, I have carried this work to a point where I think it could be taken up by a careful scientific investigator and some interesting and probably important conclusion reached, for my work on this subject, from a scientific standpoint, is inaccurate in the extreme for the following reasons:

The chemicals used were not sufficiently pure, no accurate account was taken of changes in temperature when dissolving salts, nothing more accurate than a 25 Cc. burette, graduated in tenths, was used for measuring. As far as I have been able to learn, no work has been done on this subject.

The Pharmacopoeia directs that boric acid be titrated in a strong glycerin solution. Some practical worker, obviously, has observed that the end reaction between the weak acid and the standard alkali solution was made sufficiently sharp to permit of accurate titration in the presence of glycerin. By my own observation I know that boric acid can be titrated in the presence of glycerin very satisfactorily, but I cannot suggest why. I believe this a proper question for the Scientific Section to solve, and I believe that a careful consideration of the dissociation theory in connection with suitable experimental work would throw light upon this question.

In this connection I will mention my experience in heating together borax, bicarbonate of soda, glycerin and water.

The mixture contained a large percentage of borax and soda and large volumes of carbon dioxide were given off while heating on the water-bath and finally the reaction ceased and a clear solution resulted; but if the solution be heated above water bath heat effervescence is started freely and a sediment produced.

Most pharmacists are familiar with the solvent action of ammonium acetate upon salicylic acid and with the effect of a comparatively small proportion of citric acid upon crystallized sodium phosphate. It seems probable that these and many similar cases of the kind might be explained satisfactorily by the ionic theory, and also, perhaps, the many cases of liquefaction observed, such as salol and camphor, camphor and chloral, etc.

But besides these solution phenomena there are even more practical problems that the manufacturing pharmacist would be glad to have investigated and explained if possible.

While attempting to work out a good formula for iron and manganese peptonate solution I was naturally set to thinking, what is this combination of ferric hydroxide and peptone that dissolves in water in the presence of alkali? and while experimenting for the purpose of learning if other metallic hydroxides were affected in the same way by peptone, I made scale compounds of mercury, copper and silver, as well as iron, by adding alkali hydroxide to solutions of the soluble metallic salts in the presence of peptone until precipitation and re-solution took place. These solutions were then carefully evaporated and scaled on glass in a current of warm air.

It is interesting to note that if there was a deficiency of peptone only partial solution of the metallic hydroxides resulted.

Now the question is, What are these compounds, chemically, which we pharmacists are constantly dealing with?

The manufacturing pharmacist, be he a wholesaler or retailer, needs knowledge of this kind, for it will assist him in formulating his preparations and save much time in empirical experimentation.

I recall the hundreds of experiments which I found it necessary to conduct to enable me to prepare a stable solution of the hypophosphites, including iron hypophosphites, and the desired result was obtained by a careful adjustment of the quantity of sodium citrate necessary to dissolve the iron hypophosphite. No precipitate of the sparingly soluble calcium citrate will occur, after long standing, if an excess of the citrate has not been used.

In the past few years there has been a constantly growing demand from the physicians for staining fluids prepared from the aniline colors for bacteriological and pathological work.

For a long time they, the physicians, have attempted to prepare these solutions, but with poor success, for various reasons. Now they are turning to the pharmacist for these supplies because they believe that he has, or should have, a greater knowledge of these aniline derivatives, and the technique required for preparing solutions of them, than they. It is a good opportunity to impress the physician.

Personally I have worked considerably with these staining fluids with some success, but my methods of improving them have been decidedly empirical, and I am doubtful if it would be practical to work with them from any other standpoint. In any case there is work in this field for scientifically trained men, for any investigation along these lines requires an intimate knowledge of hydrolyzing agents and influences, mild oxidizing and reducing agents, a careful technique, and familiarity with the microscope.

Probably the most important of these staining fluids, commercially, is the solution of the so-called "eosinated methylene blue" and its various modifications. The stain-powder is produced by mixing solutions of eosin and methylene blue, the methylene blue solution being alkalized, sterilized or just plain.

The precipitate formed is collected, properly treated and dried at a low temperature and dissolved in methyl alcohol.

The point is that although from different lots the precipitate is readily formed, easily collected, and when dry presents the same physical characteristics and seems to be a definite compound, the solution frequently fails to stain properly. The same difficulties are often experienced with many of the other staining fluids.

There are perhaps illustrations of unexplained problems much more practicable than those I have given, but these are some with which I have come in actual contact and am able to speak of because of rather trying experiences. I have not discussed them at length, and have only mentioned a few that seemed to me most interesting and possible of more helpful results. I hope, however, they will serve to make plain the fact that there are many problems that the practical and scientific pharmacists might, working hand in hand, solve together to the advantage of both.

Mr. J. C. Wolf moved that the suggestion outlined in the Chairman's Address in regard to closer co-operation between this Section and the Section on Scientific Papers be referred to a committee of three, to report at the next session, and this motion was seconded by Mr. Scoville and carried.

On motion of Mr. A. I. Cohn the address of the Chairman was then adopted as read.

Chairman Dunning resumed the Chair.

The Chairman suggested that there were a great many papers on the program, and that there would be difficulty in getting through the work of the Section in the time allotted, and he thought the suggestion that had been made that three censors be appointed, not to shut off discussion, but

to stop irrelevant discussion, was a good one. Thereupon Mr. Mayo, of New York, with Mr. Diner as a second, moved that Mr. Hallberg, of Chicago, be appointed a single censor for this purpose, as he considered him entirely adequate to deal with the situation by himself. This motion was duly adopted.

The Chairman announced that the next order of business was the nomination of officers of the Section for the ensuing year. Mr. Lowe, of Philadelphia, thereupon nominated Mr. F. M. Apple, the present associate on the committee, for Chairman, as he said he understood that Mr. Weinstein, the Secretary, had declined to permit his name to be used for the office of Chairman. Mr. W. C. Anderson nominated Mr. Joseph Weinstein to succeed himself as Secretary. Mr. Lowe nominated Mr. E. Fullerton Cook, of Baltimore, for associate, and Mr. Caspari nominated Mr. Wilbur L. Scoville, of Boston, for associate. There were no further nominations at this time, and the Chair announced that these would lie over, under the rule, until the next session. Mr. Lowe said he thought it would be to the advantage of the Section to have both the gentlemen nominated for associate upon the committee, if it was not necessary to limit it to three members. The Chair concurred in this view.

The Chairman then called for the reading of papers as the next order of business, and asked Mr. Weinstein to present a paper he had prepared upon the subject of "Some Points on Toxicology for the Practical Pharmacist." Mr. Weinstein presented his subject as follows :

A FEW POINTS ON TOXICOLOGY FOR THE PRACTICAL PHARMACIST.

BY JOSEPH WEINSTEIN, PHAR. D., NEW YORK, N. Y.

To the just claims advanced by the better element of the pharmaceutical fraternity that the pharmacist is not a mere merchant in drugs and in other odds and ends, looking for profits all the time, but a well-qualified professional man, performing certain duties to the community, and that as such he is entitled to special considerations—to this claim I hear often contradictory statements made by our enemies, anxious to disrobe pharmacy of its honorable professional toga. We pharmacists are so well used to the cavils of the fault-finders that we cannot afford to pay too much attention to their hypercriticisms. But a few words relative to this subject spoken to me in a genial way by a friend of mine set me pondering. Said my friend : "Remember that your allegations as to your professional qualifications are taken by the public *cum grano salis*, for your so-called professional man does not possess the necessary knowledge that the public often expects of him in their emergencies, when they run to the drug store for assistance. You say the pharmacist has no right to treat patients. But was there anybody to even ask the layman about his right to apply an improvised tourniquet to check an arterial hemorrhage, or to use his bottle of smelling salts in a case of syncope, or to give mustard water to produce

vomiting when poisoning is suspected? There is no law to prevent anybody from delivering his fellow-man when in distress, and the helplessness and inactivity of the pharmacist simply go to show that he is lacking the necessary knowledge the public expects of him as that of a professional man."

Furthermore, my friend went on to say, "I hear that toxicology is a part of the curriculum of colleges of pharmacy, that the boards of pharmacy examine the candidates in that subject, and yet, when a pharmacist is confronted with a case of poisoning that is brought into his store, he becomes entirely lost, does not know how to treat it, and is obliged to send for the physician, thus endangering the life of the patient, who is in need of quick help, at the same time bringing into disrepute your so-called professional pharmacy."

Thus spoke my criticizing friend, and indeed is it not a well-known fact that the public by an established custom looks up to the pharmacist for his assistance in emergencies? Is it not also a fact that the pharmacist is not given the necessary training how to be useful in such cases? Does not the pharmacist in most of those cases feel humiliated by his inability to render any aid, and by his remaining a mere spectator, together with the crowd awaiting the arrival of the ambulance, if such service is in existence, or of the nearest physician, who at times cannot be reached at all? Why should not the colleges of pharmacy take in consideration that in practical life the giving of first aid to the injured is actually one of the functions of the drug-store? Why not follow the example of colleges in European countries, where courses in that subject were instituted long ago? And lastly, why not legalize the drug-store as a *first-aid-to-the-injured* station? Nothing but added honor would result from such innovation, and it would help materially to enhance the druggist in the eyes of the public.

The insinuation of my friend about the inability of the pharmacist to administer the needed treatment in cases of poisoning also has some truth in it, for though the pharmacist undoubtedly knows the antidotes for the different poisons, he is apt to find himself embarrassed when undertaking to treat a case of poisoning, because of the difficulty he experiences in diagnosing what the poison was in the given case. But to handle a case of poisoning it is not absolutely necessary to know the symptoms of each individual poison, and in this paper I shall endeavor to give a few simple points in toxicology, which, when remembered, will enable the pharmacist to more efficiently perform his professional duty to the satisfaction of himself and to the honor of his profession.

In the first place be it remembered that poisons are divided into two classes, the *sedative* poisons and the *stimulant* poisons, and that each of these classes has its characteristic symptoms. Secondly, that the treatment used for one of the poisons in a class can, as a rule, be employed for the other poisons in the same class.

What are the symptoms of poisoning with a sedative drug and what should be the treatment for it?

A patient poisoned by a sedative drug will be either *semi* or wholly *unconscious*.

Face is pallid and perhaps covered with a clammy perspiration.

Pupils are variable; they may be contracted or dilated.

Respiration may be slow and shallow.

Pulse may be feeble and rapid.

Vomiting and *diarrhœa* are very characteristic.

Muscular system may have convulsions from the start, but most of the time it is in a state of relaxation and flabby condition. All of these symptoms can be combatted one by one.

For the unconsciousness: Place the patient in a prone condition, head lower than the feet, in order to allow the blood to gravitate back into the anemic brain from whence it came.

Next we attend to the body temperature. If the skin is cold and clammy we cover the patient with warm blankets or apply hot-water bottles.

For the respiration: Loosen the clothing to facilitate breathing and administer some diffusible stimulant like alcohol in some form, ether or ammonia.

For the pulse give digitalis or strychnine; the latter is both a cardiac and respiratory stimulant.

Now, how do we recognize a *stimulant* poison and what treatment should be instituted?

The symptoms of a stimulant poison are just the reverse of that of a sedative poison, and the treatment follows:

We find the patient in a state of great nervous excitability, probably in a state of convulsions, due to irritation, and contraction of the muscular system to an extent at times, when the body becomes bent like an arch, which is seen in strychnine poisoning and in tetanus.

The *temperature* is at times high and the *respiration* is of a strenuous character, that is, deep instead of shallow. The treatment consists in trying to allay the excitement. This is done with sedatives like chloral and bromides, and if the patient cannot swallow we give him the same in a rectal injection. For the *convulsions* whiffs of chloroform are given to relax the spasmodic condition of the muscles. For the *temperature* apply cold. If the brain is much irritated and delirium is present apply ice packs to the head. In other words, everything must be done to keep the patient quiet and to maintain full rest.

Be it though clearly understood that whenever the nature of the poison is known the specific physiological or chemical antidote must be administered. Our colleges of pharmacy give quite an ample course in toxicology and the pharmacist ought to be able to give proper treatment in cases of poisoning with carbolic acid, arsenic, corrosive sublimate, phosphorus,

etc. But in the majority of the cases the above outlined treatment will be sufficient to alleviate the suffering of the patient, and even in most of the cases, to save human life, and in all of the cases, to save the pharmacist from the harsh judgment of my well-meaning friend and also of those who do not mean so well, and who are untiringly trying to discover the shortcomings of the pharmacist.

Mr. Lowe, in discussing the paper, was reminded of an undertaker in Philadelphia who advertised burials at a reduced price, and said it was "a step in the right direction." He thought this paper was a step in the right direction, as it would probably keep people from being buried. He did not agree with the writer, however, as to the use of both digitalis and strychnine in cases of accidental poisoning. Digitalis is a good cardiac tonic, but not a good cardiac stimulant. In such cases he would give strychnine alone.

Mr. Whelpley, of St. Louis, commended the paper, but agreed with Mr. Lowe as to the point made. He thought information on this subject was a good thing for the pharmacist to have. Practical experience, however, was also highly important, and he had always advocated the policy of pharmacists in large cities getting in touch with outdoor clinics, by arranging that in cases of street accidents or poison accidents they might be apprised of them and given an opportunity to see the practical manner in which information of this kind is applied.

Mr. Lowe related an instance within his knowledge where, as the result of a lecture he had given at the college on the subject of opium poisoning, one of his students had been enabled to enlighten a homeopathic physician, who had not had instruction on this point in the Hahnemann College, giving the symptoms and the remedies, thereby saving the patient's life. This was an illustration of how sometimes the pharmacist may teach the physician.

This reminded Mr. Hallberg of an instance in his experience, where a traveling man had taken an overdose of laudanum, was in a state of coma therefrom, and could not take an antidote by mouth. The only thing at hand at the moment was some tincture of capsicum, half an ounce of which was administered to him by rectum, with the result that the patient was up in two minutes and running through the corridors of the hotel and made a quick recovery.

Concrete illustrations appearing to be in order, Mr. Whelpley was reminded of the statement made in the introduction to one of the standard English works on accidents and emergencies, to the effect that a young lady came to a doctor and told him that she owed her life to him; that she had gone to a drug store to buy laudanum, with the intent of committing suicide, but when she asked for and was shown the antidote to be used in such cases, namely, a quart of strong coffee, she gave up the idea of suicide rather than submit to the treatment.

Mr. Boring said that on one occasion he had relieved a man of an epileptic fit by the administration of castor oil, and the patient came to in a few minutes.

On motion of Mr. Lowe, the paper was then received and referred for publication.

The Chairman next called on Mr. W. J. Robinson for his paper on the subject of "Prescription Incompatibilities," but the author was not present and the paper was read by title and referred to the Committee on Publication.

The next paper called for was one on "Cataplasma Kaolini," by Mr. H. C. Blair but as the author of this paper was likewise not present it was read by title and referred for publication.

Mr. M. I. Wilbert then presented in abstract the following paper on "Liquid Soap," exhibiting samples of his product :

LIQUID SOAP. AN ECONOMICAL FORMULA.

BY M. I. WILBERT.

Apothecary at the German Hospital, Philadelphia, Pa.

Many of the advantages that would accrue from the use of liquid soap, in hospital wards and in public places generally, are so self-evident that it will not be necessary for me to reiterate them at this time. The detergent properties of this form of soap, combined with the general sense of safety and cleanliness that must accompany the use of an absolutely fresh particle of soap at each using, are perhaps the more prominent among these evident reasons why, when once introduced, the use of liquid soap is destined to displace the cake variety in public lavatories and in practically all places where two or more persons are expected to use the same soap.

One of the objections to the more widespread use of liquid soap, even at the present time, is the comparatively high cost of this form of preparation, largely due to the cost of the ethyl alcohol necessary in making the solution.

Methyl alcohol, while cheaper, offers serious objections and its use, in view of the many reported cases of untoward results, even from the inhalation or the external application of comparatively small quantities, is not permissible.

Being desirous of securing a liquid preparation with a minimum of alcohol a series of experiments were inaugurated that resulted in the apparent discovery that a mixture of soda and potash soaps is much more soluble in water and much more stable, in any given dilution, than either one of its constituents.

Elaborating on this discovery, we have devised a formula that produces a uniformly satisfactory product, and one that made from purified cotton-seed oil will not cost more than fifty cents a gallon, buying in quantities such as an ordinary retail druggist would be likely to use.

The formula now in use is as follows :

Sodium hydroxide.....	40 Gm.
Potassium hydroxide.....	40 Gm.
Cotton-seed oil	500 Cc.
Alcohol	250 Cc.
Distilled water, a sufficient quantity to make	2500 Cc.

In a suitable container, preferably a glass-stoppered bottle, dissolve the potassium hydroxide and the sodium hydroxide in 250 Cc. of distilled water, add the alcohol, and then add the cotton-seed oil in three or four portions shaking vigorously after each addition. Continue to agitate the mixture occasionally, until saponification has been completed. Then add the remaining portion of distilled water and mix.

The only precautions that are at all necessary is to use U. S. P. grade of ingredients, and to be sure that saponification is complete before adding the remaining portions of the distilled water. The water used must be absolutely free from soluble salts of the alkaline earths or the heavy metals and for this reason should be, preferably, freshly distilled.

The resulting preparation not being official, the pharmacist is at liberty to modify the formula to suit his own individual taste or the preference of his customers. The soap can, of course, be readily made more alkaline and it can also be made with an appreciably smaller quantity of the alkali.

For general use as a toilet soap it would of course be necessary to give it some distinctive odor. This can best be accomplished by replacing a portion of the water with distilled extract of witch hazel, rose water, or orange-flower water, or, by adding the necessary perfume, spirit or essential oils to suit the individual taste or need. A satisfactory odor, and one that offers a good talking point, might be secured by using the mixture of essential oils used as the flavoring ingredients of the Alkaline Antiseptic of the N. F. or the Liquid Antiseptic of the U. S. P.

These few suggestions should suffice to indicate that there is practically no limitation to the possibility of varying the resulting composition or the odor of this soap, and the price at which it can be produced, even in small quantities, should be an incentive for retail pharmacists to develop a demand for a preparation of this kind and to supply the resulting wants of his customers himself.

Mr. Wilbert, at the suggestion of the Chairman, also read his paper on "Sodium Oleate," as follows :

SODIUM OLEATE. SOME COMMERCIAL PREPARATIONS CONTAINING IT.

BY M. I. WILBERT.

Apothecary of the German Hospital, Philadelphia, Pa.

While it is not within the province of the pharmacist to enter upon the existing controversy as to the relative merits of medical versus surgical

treatment of cholelithiasis, it is clearly within his sphere to be informed on the nature or the composition of remedies that are recommended or used from time to time.

Just at present sodium oleate and preparations containing sodium oleate are receiving considerable publicity in the advertising pages of medical journals, and not a few of the more prominent medical practitioners of this country have endorsed these preparations in the reading columns of the same journals.

It should be remembered, of course, that there is a wide difference of opinion on the uses or the efficiency of these preparations, even in Germany, the home of soap and its uses. Thus Drs. Blum and Clemm have used sodium oleate extensively with excellent results, while Th. Rosenheim (*Deutsche Med. Wochschr.*, 1905, No. 41) characterizes the effects claimed for sodium oleate as theoretical lucubrations devoid of any exact foundation. He himself has not seen any practical results as the outcome of this treatment.

In view of these widely differing opinions on the uses of these substances it would appear particularly opportune that the pharmacist know something of the origin, composition and uses of the several preparations.

A substance that is essentially a mixture of sodium oleate and oleic acid, in comparatively dry form, has been sold in this country, for at least several years, under the trade name "eunatrol." It is marketed either in the form of pills containing approximately 4 grains each or in 25 gram vials of the substance itself. A similar preparation can readily be made by any pharmacist at a very much reduced cost, by using the following quantities of U. S. P. ingredients:

Acid Sodium Oleate—

Sodium hydroxide.....	25 Gm.
Oleic acid	280 Gm.
Distilled water	25 Cc.
Alcohol	50 Cc.

In a Florence or Erlenmayer flask, of suitable capacity, dissolve the sodium hydroxide and finally add the same to the mixture of alcohol and oleic acid in a porcelain mortar or other suitable container. Allow the resulting mixture to stand, in a warm place, until the soap formed has been dissolved in the excess of oleic acid and alcohol. When smooth transfer the mixture to shallow trays or glass plates and place in a moderately warm place to dry.

W. N. Clemm (*Pharmacologische u. Therapeutische Rundschau*, 1905, No. 14) recommends a sodium oleate that is practically free from excess of oleic acid. Such a preparation may readily be made by using the following quantities and observing the general directions given above for the acid sodium oleate:

Sodium Oleate—

Oleic acid	285 Gm.
Sodium hydroxide.....	40 Gm.
Distilled water.....	50 Cc.
Alcohol	150 Cc.

The product resulting from this formula contains but a small proportion of free oleic acid and is a firm white or yellowish-white soap. It may be used in the making of a number of other preparations that have been suggested from time to time.

Dr. Clemm himself recommends giving the preparation either in substance or in the following mixture :

Sodium oleate.	10 Gm.
Pineapple essence	1 Cc.
Tincture of valerian.....	5 Cc.
Peppermint water, a sufficient quantity to make.....	150 Cc.

Of this mixture a tablespoonful may be given two to six times a day.

A mixture that is said to be similar in composition to the above is being marketed, in Germany, under the trade name "Cholelysin."

Dr. J. Rauchmann (Med. Wochschr., 1905, No. 19), recommends the use of sodium oleate in the form of pills, and proposes the following formula :

Sodium oleate.....	25 Gm.
Glycerin,	
Kieselguhr, of each a sufficient quantity to be made into 100 pills.	

At the present time a preparation called "probilin" is being advertised quite extensively to physicians in this country. This preparation is marketed in the form of pills that are said to contain $1\frac{1}{2}$ grains each of acid sodium oleate and salicylic acid, 1 grain of phenolphthalein and $\frac{1}{4}$ grain of menthol.

This form is impracticable, and even the manufacturers have evidently found it impossible to follow. This can readily be demonstrated by weighing one of the pills as marketed in this country; at the modest price of fifteen dollars a dozen vials of sixty pills each.

The pills as sold on July 1st of this year contain approximately, the equivalent of $1\frac{1}{2}$ grains of sodium oleate, $\frac{1}{4}$ grain of salicylic acid, $\frac{1}{8}$ grain of phenolphthalein, $\frac{1}{6}$ grain of menthol, and 1 grain of an insoluble, inert powder; probably powdered glycyrrhiza.

Much of the advertising material put out by the American agents for "probilin" is wittingly or unwittingly garbled and, therefore, misleading. In practically all of the circulars that have been published for distribution in this country, the manufacturers or agents quote Kuhn (Zeitschr. f. klin. Med., vol. 53) as saying that "salicylic acid is the best biliary disinfect-

ant." This author really says, in commenting on the substances that are available as biliary disinfectants, "for clinical use the long established sodium salicylate remains," as the most satisfactory biliary disinfectant.

Following the suggestions of Kuhn, and the general formula suggested by Dr. Reynold Webb Wilcox, in the Journal of the American Medical Association (Aug. 4, 1906, page 347), we have used the following :

Sodium oleate.....	0.10
Sodium salicylate.....	0.10
Phenolphthalein	0.06
Menthol.....	0.015
Make one capsule.	

This preparation has been used rather extensively and appears to act quite satisfactorily. It should be added, however, that these capsules are much more active than "probilin pills" and should not be given in the same quantity, as phenolphthalein, in even moderately large doses, is known to have caused startling, if not dangerous, secondary effects.

Mr. Diner, seconded by Mr. Puckner, moved that the two papers last read be received and referred to the Publication Committee.

Mr. Asher, of New Orleans, discussing "Probilin," referred to in the last paper read, asked Mr. Wilbert if he had found in any of these preparations the use of acid sodium oleate. Mr. Wilbert replied that he gave the formula in the paper for acid sodium oleate, and he exhibited a sample, saying that, so far as he knew, acid sodium oleate was not a true chemical compound, but was simply a mixture of sodium oleate and oleic acid.

Mr. Hallberg said this was one of the most largely used proprietary medicines of the present time, and referred to a paper in one of the leading medical journals claiming wonderful things for this combination, and also giving the formula, but accompanied by the statement that true acid oleate of sodium was not to be had on the market, and, therefore, the physician who desired to use it had better order the ready-made pill.

The Chairman, referring to Mr. Wilbert's statement, said that Prof. Ira Remsen, of Johns Hopkins University, in a lecture which he had heard, stated that acid oleate of sodium was a true chemical compound.

Mr. Puckner said he thought the average pharmacist was unduly overawed by the term "chemical compound" as applied to acid sodium oleate and such compounds. Acid sodium oleate should be two-thirds sodium ; and he described the process of making this compound, but suggested that those who tried it would probably be surprised at not getting the same compound as that on the market. Mr. Scoville wanted to know of Mr. Wilbert what he meant by "refined oleic acid," which he understood him to refer to, and said that the acid oleate of sodium exhibited had a differ-

ent odor from any oleic acid with which he was familiar. Mr. Wilbert replied that he had been unable to get a satisfactory oleic acid on the market that conformed to the Pharmacopœia, and that the crude red oil offered by the dealers did not answer the purpose for which he desired to use it.

The two papers last read were then received and referred for publication.

The Chairman next called on Mr. H. P. Hynson to read his paper on "The Eyes and Hands in Dispensing." Mr. Hynson, after a short preliminary statement as to how he came to write this paper, presented his subject as follows :

THE EYES AND HANDS IN DISPENSING: TECHNIQUE.

BY HENRY P. HYNSON, BALTIMORE.

"The science and art of pharmacy, we are told, must be known ; consequently both the science and art of pharmacy must be taught, but who will tell us which is the ' science ' and which is the ' art ' ? "

While, probably, not altogether consistent with truth, we may, for the purpose of convenience, call the work of the brain the science and the work of the hands the art, and so it may be said that sense is science and act is art ; we must know how to dispense and we must be able to dispense.

To be able to dispense, our hands must do quickly and well what they are told to do, yet they cannot at once do this ; they must learn to do it by trial, by repeated, oft-repeated practice, guided and helped, at first, by the eyes. Good, willing hands, hands that do not tire of trying, will soon be able to do without the eye when hands only are used. If they are required to use implements which cannot be made to see, then the assistance of the eye must be had, and since implements are constantly needed, the eye and hand should be taught to act together and for each other.

It should not be thought that there is any inherent relationship between knowing how to dispense and being able to dispense. The same application that leads a person to learn how, may also lead him to become able, and this, indeed, would be the natural tendency of a good mind, yet it is just such a consistently inclined character who often finds that it is only by great effort and through the consumption of much time that he may become even a fairly proficient dispenser, and it is such ambitious characters that we should encourage and help.

Then, to cite cases, it will probably be more effective to invite the evidence held in every one's mind of the many instances of those who knew well, perfectly well, *how* acts should be done, and knew and appreciated the results of well-doing, who were totally unable to produce the desired effect, simply because they lacked practice. It must be acknowledged that such persons are in a sad situation, if their very success and comfort depends upon the doing of that which they are unable to do, or who, if

they are, after awhile, able to accomplish the act, have consumed much more time and much more energy than those who are perhaps their actual competitors. Most unfortunate are those would-be dispensers who do not know how much they are directly losing in time, in money, because their hands and eyes have not been properly trained, nor how much they are indirectly losing, because of the tried patience of their customers and the unfortunate reputation they are making; nor of the condemnation they are inviting, because of the suffering and, mayhap death, following the delay and damage of improper technique. Let it be understood clearly and with positiveness, that there can be no approach to perfect art of any kind, where practiced technique is lacking.

First think, think hard and, with advice, wisely and thoroughly thinking, learn what to do, and then teach the hands to do it, to dispense. How? How does the boy learn to accurately throw a ball? how have our high-priced baseball pitchers learned to control a ball so well? how do we learn to handle the billiard cue; how does the pianist become able, at almost lightning speed, to accurately and delicately manipulate the keys, with eyes otherwise engaged, as does the violinist, using fingers in one place and arm in another, with both measuring distances with extreme accuracy, practically, in the dark? Is it not by practice, patient, tireless practice? Are not all such accomplishments attained through practice? It is the veriest folly then; for any one to suppose he may become even fairly proficient in the art of dispensing, without a great amount of practice; practice which should be secured when failure would not mean serious loss to either novice, employer or client. Practice through regular course of trade comes so slowly and uncertainly, and is fraught with so much danger to all concerned, that schooling practice of the eyes and hands should be insisted upon by every one connected with pharmacy, because it is without danger and is less expensive.

It should not be denied, neither can it be denied, that any kind and all kinds of practices with the hands make every new effort easier because of the control won by practice in other directions. This is very encouraging. The discovery of a remarkably good manipulator in a recent class, in the person of a student who had had no store experience at all and whose general movements were such as to forbid the thought of his having any such ability, forced the question, "Have you ever made special use of your hands?" "In no other way than in playing the violin a good deal," was the answer. He was intelligent and knew what to do, and because he had previously learned to use his fingers and hands, he quickly became a better manipulator in the laboratory than many of equal intelligence who had had four or five years' employment in drug stores.

The best training of the hands is to be had in the very earliest days of one's life, and it is not unlikely that manual dexterity so often, because of environment, attributed to heredity, is directly due to the early training

induced and made possible by environment. When one cannot remember a point nearer his nativity than a time when he was using tools and making toys, miniature things, it would be strange if he had not been called a "natural mechanic."

The pharmacist or the student of pharmacy is fortunate then, if in his early boyhood he learned to knit, to sew, to use tools, to play musical instruments, even if the use of the latter taught him no more than to "blow," for it is no small accomplishment for one to be able to "blow his own trumpet" artfully, just as he must use his hands.

It may be supposed that the pharmacist has learned to *keep* his hands. Itself an art, which, if known to many, is not well practiced by them, however polite and desirable the practice may be. It is, indeed, fundamental and if it has not been learned earlier, this art of keeping the hands, it must be learned in the very first days of college life and it must not be forgotten that the nails are a part of the hands and may become the most conspicuous parts of the dispenser's hands.

However much of eye alertness we may accredit to inheritance, it may be increased and rendered more serviceable by exercise and practice. Careful and intelligent training of the eyes is next in importance to the training of the hands of the dispenser; in fact, well-trained eyes are the very best assistants one's hands can have.

It will be impossible for a person to become a finished dispenser until his eyes have learned to quickly and surely differentiate colors, measure distances, bulk and capacity, apprehend differences, make comparisons, appreciate form and discover irregularities. The dispenser must really see when he looks and then must understand when he sees. There are, for instance, so many acting dispensers who can not decide whether a liquid holds suspended material or not; it is difficult for them to see comparatively large particles or floating matter in them; they are unable to discover irregularities in the sizes of pills, nor can they tell whether a pill is clean and white or dirty. Powders unevenly folded, like "coons," all look alike to them.

The would-be dispenser, in his early school days or perchance later, may have trained his hands to write in a clear, distinct, uniform style; it is hoped he has done so and that his eyes have been so trained in the principles of esthetics that he will know how to properly place this writing; but if he has not done so, this must be his next effort and he must practice until he succeeds and understands. Labels must be written; prescriptions must be copied. All must be plainly written, must be attractively written. If our dispenser did not learn to write when it was easiest for him to do so, he must pay the penalty for the neglect and learn now, when it is much more difficult. If he is so fixed in the habit of making bad letters that the habit can not be corrected, then let him begin to make new letters, another style, vertical or back hand; but by all means, let these

new one be made properly and uniform. He surely can make a straight vertical line one eighth of an inch long ; let him make thousands and ten thousands of these of equal distance from each other. Then let him make many thousand more three sixteenths of an inch long, gradually increasing one sixteenth for each lot until he can make perfectly straight vertical lines, one inch long and exactly parallel with each other, when he has made as many "O's" and as many "stems" of as many different sizes and quite as uniform, he may be assured he has learned to write.

In label-writing, centering and spacing are very important, and a proper appreciation of balance must be acquired by persistent study and practice. It is this eye and hand ability that can not be over-valued by the dispenser ; such will help the exploitation of his scientific attainments as nothing else can. It speaks loudly of control, of care, of accuracy and of culture. Label-writing, prescription-copying, package-addressing, may be made to embellish where they are so very often made to destroy the art of dispensing. Is it not, then, good business sense to see that the former effect is produced?

The special manipulations, those peculiar to dispensing, may be more appropriately treated as a pharmaceutical subject. In weighing and measuring trained eyes and hands may be made to save much time, the very kind of time that is money. The training that will enable the eye to quickly bring the sight of the rifle properly on the target will quickly catch the marking on a graduate. The same eyes will soon learn to weigh substances, and will later need balances for certification only. And it will be trained hands that will quickly follow the eyes, directing when their every movement will be graceful because useful ; efficient movements are always graceful, because they accomplish the desired end with the least friction and the least loss of energy. Does this not apply when the graduate is steadily brought on a line with the eye, body erect, by the arm, and is it not outraged when the upper half of the body is repeatedly bent to catch the markings on a resting graduate. If it is proper that the handle end of the table knife and fork should rest in the palm of the hand, a fact seemingly not appreciated by some very excellent persons, and in this way to be safely but loosely held between the thumb and fingers, so it is with the spatula. In this position, and so held, it will always be most useful, most effective, and best controlled ; it will, of course, be most gracefully handled. The stiff and awkward hand grasp, too common, is one of the greatest hindrances to rapid and successful dispensing. This is most apparent in rolling the pill pipe. The practiced operator fairly "whips" the cylinder into shape, and to the required length, while holding it under perfect control with the spatula. This same supple handling of the spatula makes it most useful in all operations, and it is this loose but certain hold of the pestle also that must be acquired before one may become master of this most effective implement. Pestles should, invariably, be directed by the fingers, but the force should come from the palm of the hand.

It is in operations where the hands alone are used that they do their best work, and he who works as many fingers at a time as possible, is an economist and a winner. One finger and one palm can be made to roll but one pill at a time, and this slowly and awkwardly, but six fingers and two thumbs may be made to roll four pills at a time, quickly and gracefully. It is in wrapping powders and in making packages, when one has learned to use nearly all his fingers and both thumbs all the time, that he learns to respect the wonderful mechanism of his hands, and almost concludes that they were especially formed for this particular purpose. The dispenser may, indeed, test his dexterity and be led to further practice when he fails to find appropriate and effective use for every digit at the same time when wrapping a package.

It is because I have noticed a lack of sufficient training in dispensers, especially in students, that I have been induced to bring the subject before you for discussion, hoping to establish its importance and lend some assistance toward the discovery of the underlying principles directing it.

Mr. Searby moved that the paper be received and referred for publication.

Mr. Searby then proceeded to commend the author for taking the pains to write such a paper on the little things that the pharmacist should know how to do and do well. About ninety-nine per cent. of what the druggist has to do is little things, and he heartily approved the paper. He himself had been brought up in the drug business in England, where, for one thing, they paid particular attention to the handwriting of the drug clerk, and to neatness and correctness in labeling, and he stated that the clerk who wrote a bad hand had a hard time getting a position there, while a good handwriting would get a man a position as quick as anything else in Great Britain. He also spoke of the desirability of the proper handling of the pestle, without which proper manipulation could not be done with a large mass.

Mr. John Uri Lloyd expressed his pleasure at Mr. Hynson's paper, and said that he was reminded that one of the most truly scientific touches he had ever accomplished was when he learned to wash a bottle properly. For the first six months after he became an apprentice he had as a duty the washing of bottles day in and day out. When he commenced this work he would fill the bottle with water to wash a single straw out of it, but when he poured the water out the straw was still there. He would fill the bottle again, and perhaps again, with the same result. After he had washed gross after gross, to be filled with citrate of magnesia, which was then the fad of physicians, he learned that he could not afford to take the time to *fill* the bottle with water; he didn't have the scientific touch to wash bottles naturally, but business made it necessary for him to get it. He finally learned that an ounce of water, with proper rotation and an

expert throw of the liquid, would displace the straw every time. This was the science of experience.

Once he had stood beside a potter, a man who could not read or write, who took a piece of mud and put it on a wheel and turned it out a jug. It was the touch of the science of experience. He took another piece of clay, and lo and behold it became a bowl under the touch of the same finger. He said to the potter, "My friend, let me make a bowl: I myself am called by some a man of science." He made a futile attempt, and learned the lesson that it was the touch of experience that made that potter a master, a scientific man. Another time, in Kentucky, he had seen an ignorant negro team-driver, who could neither read nor write, stand on a high pile of lumber and take a plank, piece by piece, as it was handed up to him and turn it and twist it by an expertness to be admired and throw it into its right place. The plank seemed to walk to its location; and again he thought he could do the same thing, but where the plank *should* go it did not go. It was a twist of the wrist. Anybody *who knew how* could do it. It was the expertness of experience. And so it is also all through the detail work of the pharmacist; it is the science of experience that counts, and he would not allow any man who considered himself as being, in his own little realm, the *only scientist*, to say to him that there was no science outside his restricted realm. He knew a man who thought if another did not know a puff ball he was not a man of science. To him science was born and bred in the fungi field. That man was mighty in *his* science, but was not qualified to judge of what was the other man's science. So Mr. Lloyd knew of others, unnecessary to name, just as narrow, who made their own little criterion, the result of their own little hobbies, the definition of a scientific man. They, too, were absolutely narrow in that they lacked comprehensive toleration of others. It takes it *all* to make real science. The negro driver on the pile of lumber was scientific in his sphere; the potter was a scientific man in his little world, and the man who stands before the red-hot crucible, and without knowing symbol, formula or equation makes the finished prussiate of potash, is a man of science, as well as the man who understands and explains the processes by which it is done.

Mr. Hallberg called particular attention to the desirability of ambidexterity on the part of the young man in the drug business, and gave illustrations of how useful it could be made in manipulatory processes. He also referred to the sometimes serious consequences of color-blindness in the youth in pharmacy, and the desirability of having apprentices examined for this defect. He expressed his appreciation of the eloquent remarks of Mr. Lloyd in his tribute to the skilled artisan, the science of manual experience and training.

The Chairman called on Mr. Apple to preside while he read his own paper on the subject of "Solid Opodeldoc."

SOLID OPODELDOC.

H. A. B. DUNNING.

Subsequent to the appearance of the last edition of the National Formulary I have had several orders for linimentum saponato-camphoratum, solid opodeldoc.

The physician who wrote for this preparation complained that it did not have the characteristics of the old-time opodeldoc, or Squier's opodeldoc, in that the N. F. preparation was decidedly opaque, and when rubbed on the skin did not distribute readily.

Upon investigation I learned that the old formula called for soap made with animal fat, and also that the German Pharmacopœia directed the use of the official medicinal soap, made from olive oil and lard. After trying several soaps purporting to be made from animal fats, and getting no better results than when following the N. F. method, I prepared some medicinal soap according to the German Pharmacopœia, and made the solid opodeldoc according to that authority. This was some better than the N. F. product, but was decidedly opaque and did not rub in as nicely as a sample of Squier's opodeldoc purchased on the market.

Having some sodium oleate in stock I used a quantity of this dissolved in alcohol sufficient to cause the solution to solidify on cooling. This experiment furnished a product very much like that directed by the N. F. I then made some sodium stearate from sodium carbonate and stearic acid and dissolved the salt in alcohol. After solidifying, the product seemed to have almost the identical properties of the sample of Squier's opodeldoc. After some further experimenting the following formula was evolved :

R Sodium carbonate, monohydrated .....	.5
Stearic acid	2.5
Water	5.0
Alcohol	50.0
Camphor	1.25
Oil of thyme .....	.15
Oil of rosemary .....	.3
Stronger ammonia water	2.5

Dissolve sodium carbonate in the water by heat, add 10 Cc. alcohol and the stearic acid, warm until effervescence has ceased and perfect solution is effected, add balance of alcohol, and when not too warm, the oils and ammonia water, filter into bottles, closely stopper, and set aside to cool.

In line with the above and in accordance with my usual custom, I have, during the past year, made notes of the difficulties encountered in preparing some of the official preparations. In regard to N. F. elixir of terpin hydrate and its combinations, I find that contrary to my first conclusion it is not the terpin hydrate which crystallizes out on standing, but it is the sugar, and this only occurs when the syrup is made stronger than the official.

Elixir of paraldehyde, N. F., requires a larger percentage of alcohol to prevent formation of two layers.

Magma of magnesia is rather a tedious preparation to make and somewhat too costly. There should be a foot-note to this formula, explaining that the amount of sodium hydroxide is calculated as 100 p. c.

The formula for iron and manganese peptonate solution, N. F., is a very poor one, and the preparation made according to its directions is something terrible, smelling more like decayed eggs than any other organic compound with which I am familiar.

Syrup of phosphates, comp., N. F., becomes turbid on standing, probably due to the presence of citric acid and a soluble calcium salt.

Elixir of hypophosphites, N. F., directs an insufficient amount of water to dissolve the calcium salt; the formula should read 14 ounces instead of 8.

Solution of hypophosphites should contain some sweetening agent, and enough alcohol to preserve.

It is necessary to use the acid glycerophosphate of calcium to make a permanent solution according to formula for elixir of glycerophosphates N. F. This preparation is really a solution of acid calcium phosphate, phosphoric acid and a varying amount of glycerophosphoric acid and glycerin according to age.

Although I have not tried the N. F. formula for solution of iron peptonate my experience with a similar formula teaches me that it is impracticable. I simply offer this comment to provoke discussion.

A better U. S. P. mercurial ointment could be made, I believe, if anhydrous lanolin should be used as the extinguishing agent.

Syrup of orange would probably be better without the addition of citric acid.

Mr. Wilbert did not agree with the author of the paper as to magma of magnesia, in the implication at least, that a larger proportion of sodium hydroxide should be used. Mr. Scoville thought the author of the N. F. formula was correct, as it was intended that there should be a slight deficiency in the formula, and he thought the omission of the foot-note was an oversight. The chairman said that his object was to have corrections made that were desirable, not to indulge in adverse criticism. Mr. Raubenheimer, in this connection, called attention to a paper he had prepared on the subject of magma of magnesia, to be read later before this Section; and referred particularly to what he had to say on this disputed point.

Mr. Hynson said he thought pharmacy had made a distinct advance when one could use a definite chemical instead of a compound like soap, and that this line of work was desirable and should be encouraged.

The paper, on motion of Mr. Searby, was then received and referred for publication.

Mr. Dunning resumed the Chair, and called for a paper by Mr. Apple on "Hints on the Compounding of Glycerin, Benzoin and Rose Water." Mr. Apple presented his subject as follows :

HINTS ON THE COMPOUNDING OF GLYCERIN, BENZOIN AND ROSE WATER.

BY FRANKLIN M. APPLE, PH.G.

Having had considerable difficulty in dispensing this combination extemporaneously, and observing that the mixtures dispensed by my fellow pharmacists were equally unsatisfactory and unsightly, an endeavor was made to learn the cause of the difficulty, also to devise a satisfactory formula.

After repeated experimentation I have concluded to advise that the extemporaneous compounding of this mixture be discontinued, for it is an impossibility to dispense it in a satisfactory condition by simply mixing the ingredients together.

As the cost of the mixture is very small, it should be prepared as a regular stock preparation, in anticipation of a demand for it, for then it can be dispensed in a condition that will reflect credit upon and inspire admiration for the proprietor selling it.

The most satisfactory result of many methods of manipulation is exemplified by the product exhibited for your inspection, which was prepared according to the following formula :

R. Tr. benzoini	3 iij
Glycerini	3 viij
Aq. rosae	q.s. ad. ft. Oj
M.	

Add the tincture of benzoin, in repeated portions, to 4 fl. ozs. of the glycerin, agitating thoroughly after each addition. Allow to stand for an hour, then add in small amounts, with thorough agitation, a sufficient quantity of rose water to make 8 fl. ozs.

Immediately strain the mixture through a *very fine-meshed* straining cloth, rubbing same through the strainer with a glass rod or bone spatula. Repeat this operation 3 or 4 times, thereby breaking up completely the curds formed by the precipitated resin of the benzoin, and enveloping them with a watery menstruum, thereby preventing the possibility of an agglutination of the finely divided curds. After allowing the mixture to stand for several hours, the remaining glycerin and rose water are added in the order named, with thorough agitation, when a fine, creamy product results. At first the curds formed will float upon the surface of the liquid, but, gradually, they will all descend to the bottom of the mixture. This latter behavior is one of the reasons for advocating the anticipation of a demand by previous preparation of the mixture, as it is far better to always dispense a uniform product if possible ; for, by so doing, greater confidence is engendered for your abilities as an accurate dispenser.

The product exhibited was prepared almost a year ago, and it is plain to be seen that it still is a preparation none need feel ashamed to dispense.

Mr. Anderson moved to receive the paper and refer it for publication.

Mr. Wilbert suggested that any one wanting to make a stock preparation should experiment with a minute quantity of soap, as it was astonishing how small an amount of soap would make an emulsion that would stand. A small quantity of either soft or liquid soap would do.

The chairman, in this connection, called attention to what he termed an ideal preparation of this character, made by the aid of soap, with the formula on the bottle, that he had brought with him to give to Mr. Apple. This was circulated among the members.

The paper was then referred for publication.

Mr. Diner, of New York, was then invited to present a paper on the subject of a "Card Index System for Prescriptions." The gentleman explained his subject in verbal detail, the text of his paper being as follows :

CARD INDEXING SYSTEM FOR PRESCRIPTIONS.

BY J. DINER.

"Eternal vigilance is the price of liberty."

This motto should be prominently displayed in every prescription department, and no trouble or labor should be too much to enforce it. When one considers that in every line of business old and antiquated methods have long ago given way to modern systems we must ponder why the prescription department, one of the most important factors of daily existence, still clings to its ancient way of doing business.

However, I shall not enlarge upon the necessity of adopting more modern methods in the checking and filing of prescriptions. The need of this must be apparent to every druggist who has not yet forgotten how to think ; but I will briefly describe a system which I have in use, and which is so inexpensive as to be within reach of every pharmacist in the land.

From any first-class stationery store, or preferably from one making a specialty of card index business, you can obtain a card similar to the following :

DINER'S PHARMACY.

No

Price, 0.50.

Prepared by

Checked by

The cost per 1000 is \$1.25, and this can be shaded somewhat when buying in larger quantities. A box to hold these cards can be purchased at very small cost, about \$4.50 for a two-drawer cabinet, each drawer holding 1000 cards, and transfer cases holding 1500 cards can be had at about 30 cents each.

After a prescription is compounded the clerk who made up the recipe turns the original recipe face down, and from memory copies on the card just what he used in filling the recipe. If there is another clerk in the store he then checks up with him, one man reading the original recipe, the other checking on the card what has actually been used in the compounding of this recipe. Then anything else that is of importance, such as *modus operandi*, excipient, etc., is noted on the card. The original

DINER'S PHARMACY.

No. 61519.

Price, 0.50.

DR. A. B. JONES.

Date vi. 4, '07.

Prepared by J. D.

Checked by M. M.

Strychniæ sulph.....	} Mixed with glycerin.
Quin. sulph.	

Caps. No. 2.

Div. in caps. No. XII.

Sig. One cap. 3 times a day.

June 6, 1907. M. M.
A. H.

M. B. SMITH.

recipes can be kept on a simple file, and when a sufficient number have accumulated they may be stored away in cigar boxes, with the first and last number plainly marked on the outside of the box.

Repetitions are filled from the cards, noting the date and name of clerk (also checker, if such there be) on card (as indicated in sample.) From the same firm where you get your cards you may also obtain what is known as guide cards. These cards protrude a little over the regular cards, and on the prominent part can be marked the first number of each 100, thus enabling you to readily locate the number you want, since it must be between the two guide cards beginning and ending that 100 of which the number you are looking for is a part.

As to the advantages of this system :

1. You have a check on yourself every time after you fill a recipe.
2. In refilling a recipe you do not have to decipher anew the frequently illegible handwriting of the M. D. (particularly illegible after time and paste have done their work).
3. In repeating a recipe you have only one recipe before you, and can

not by accidentally glancing on the recipe above or below (as is the case with recipes pasted in a book) make a mistake.

3. Two clerks can fill recipes at the same time without pulling the old cumbersome book away from each other.

5. You can make annotations on cards which you can not always, for want of space or other reasons, make on the original.

6. By keeping tab on the repetitions you always have a complete history of the recipes before you, which very often proves of importance, particularly in cases of litigation. The trouble and expense connected with carrying out this system are so small as to hardly deserve any consideration.

Mr. Hynson heartily commended this card-index system, and went into some detail as to a like system he used in his own business. He referred to a similar paper presented at the meeting in Philadelphia in 1902 by another prominent New York pharmacist (Mr. Alpers), which he mentioned to show that "men of ability frequently had ideas in common."

Mr. Hallberg was here moved to remark that he too, like Mr. Hynson, "was too modest to speak always" on the papers presented, but he had to say something here. He thought that this method of filing prescriptions had assumed more than ordinary importance at the present time, because of the movement throughout the country among pharmacists, particularly in the local branches, to endeavor to restrict the promiscuous refilling of prescriptions. If the local branches succeeded during the coming year in establishing an *entente cordiale* between the pharmacist and the medical profession as to the status of prescriptions, this particular system of filing would be of more importance than heretofore.

The paper was then received and referred for publication.

The chairman called on Mr. Harbold, of Philadelphia, to read a paper he had prepared on the subject of "External Antiseptic Preparations," and the gentleman presented his subject as follows :

A FEW MERITORIOUS EXTERNAL ANTISEPTIC PREPARATIONS.

BY JOHN T. HARBOLD, P. D.

Apothecary, Pennsylvania Hospital, Philadelphia, Pa.

The following preparations I have been dispensing for nearly four years at the Pennsylvania Hospital, and they have given entire satisfaction to all who have had occasion to employ them.

ANTISEPTIC GLOVE LUBRICANT.

On entering upon my duty as apothecary at the hospital I was frequently asked by the surgeon on duty to procure for him some lubricant that would facilitate the putting on and removal of rubber gloves. As there are numerous preparations of this kind on the market, and as it invariably happened that no two surgeons agreed in their choice of a variety, I was

obliged to add to my stock of preparations continually, and encounter annoyance from time to time through the delay of the wholesaler in supplying special preparations when same were not carried in stock. To avoid this inconvenience, I made up the following standard preparation, which we have used exclusively ever since. In the use of this preparation we have overcome the delay and annoyance, made use of our laboratory, and have a far more economical product.

Following is the formula which may be modified to suit the various needs :

Tragacanth.....	1 ounce.
Boric acid.....	4 drachms.
Formaldehyde.....	1 drachm.
Oil gaultheria.....	5 drops.
Oil rose geranium.....	3 drops.
Alcohol.....	4 ounces.
Water ...	24 ounces.

Dissolve the tragacanth in water, in which the boric acid had previously been dissolved. Dissolve the oils in the alcohol, and add this solution portion by portion, to the mucilage of tragacanth, shaking the mixture after each addition. Then lastly add the formaldehyde.

The value of the above preparation is enhanced by the increasing use of rubber gloves. It is non-greasy, non-irritating, smooth, of perfect consistency, and may also be used to lubricate surgical instruments, catheters and sounds.

ANTISEPTIC FLEXIBLE COLLODION.

This is a modification of a formula by Dr. Hopkins, and it has entirely replaced the official flexible collodion at the Pennsylvania Hospital. The surgeons find it especially satisfactory in closing punctures, dressing wounds, and as a protective covering after suturing in surgical operations.

Collodion cotton.....	10 drachms.
Alcohol.....	6 ounces.
Tincture of benzoin.....	3 ounces.
Ether.....	25 ounces.
Mercuric chloride.....	1-2000.

Dissolve the cotton in the ether, shaking until it becomes the consistency of paper pulp; then add the tincture of benzoin and shake the mixture thoroughly. To this mixture add the alcohol in which the mercuric chloride has previously been dissolved.

HAND AND TOILET LOTION.

This latter is non-sticky, non-greasy, and non irritating. It is bland and smooth, and of perfect consistency, requiring no shaking before use, and has antiseptic properties as well.

Tragacanth	2 drachms.
Quince seed	15 drachms.
Borax	6 drachms.
Boric acid	8 drachms.
Glycerin	10 ounces.
Alcohol	10 ounces.
Sodium benzoate.....	3 drachms.
Boiling water.....	5 pints.
Perfume, q. s.	
Color, q. s.	
Water, sufficient to make.....	8 pints.

Add the tragacanth to two pints of water, stirring until it dissolves, or becomes a homogeneous mixture. Steep the quince seed in the boiling water for four hours, stirring frequently; then strain carefully. Dissolve the borax, sodium benzoate, and boric acid in the remainder of hot water. Add the perfume and glycerin dissolved in the alcohol, and finally the tragacanth and quince-seed mucilage, which had previously been mixed, portion by portion; shaking after each addition, in order to get a thoroughly homogeneous mixture. The consistency may be varied by addition of water.

This is not only a highly satisfactory preparation, of which we use more than thirty gallons annually; but it can be made more economically than the benzoin, glycerin and rosewater mixture, which even when made with hot water, more or less of the benzoin is precipitated, making an inelegant and unsightly mixture.

In the above preparation tincture of benzoin may be incorporated with more satisfactory results than can be obtained with the benzoin, glycerin, and rosewater preparation, if done carefully, as there is more body to the preparation in which to suspend the benzoin. However, it must be remembered that if tincture of benzoin is to be added, it should be dissolved in the alcohol, perfume and glycerin before mixing with the mixture of tragacanth and quince-seed mucilage.

Mr. Wilbert, discussing the paper just read, said that he considered the first formula for a lubricant an interesting one and useful for many things, but he did not think it would be the best for the purpose recommended. Rubber goods are used supposedly to sterilize the hands, and he did not think it conducive to sterility to put on a pair of rubber gloves smeared over with this compound. A method he had seen often used—a method which he thought pharmacists should suggest to physicians—was, to drop the gloves, package and all, into the antiseptic solution. The surgeon sterilizes his hands as though he were going to operate without gloves, opens the package, fills the glove with the antiseptic solution, and puts his hand into it, displacing the solution with his hand. This plan insures a minimum of trouble and a maximum of sterility. He preferred as a lubricant the mucilage of Irish moss, *N. F.*, evaporated to one-third its

volume. Mr. Wilbert recommended the use of twenty per cent. of peroxide of hydrogen in toilet preparations for the hands as making them very much more efficient for the cure of chapped hands, the only trouble being that it does not make a permanent preparation.

Mr. Hynson asked Mr. Wilbert if such an antiseptic preparation as suggested would be sufficiently active to destroy germs, and Mr. Wilbert replied that he did not think a lubricant of this kind would be permissible for a surgical operation, though it probably would be where the surgeon simply desired to make an examination.

Mr. Hallberg related how, about four years ago, one Dr. Murphy, in an article in the "Journal of the American Medical Association," had advocated a solution of rubber in benzin as a substitute for the rubber gloves, giving the formula for preparing the same, as furnished by his chemist. The benzin was to be boiled for half an hour in a stoppered glass flask, in order to completely sterilize it before the introduction of the rubber, which had been previously cut in pieces and soaked in formaldehyde. Sometime after that two trained nurses at a hospital were making this solution and set fire to the place, and one of them lost her life and the other was severely injured; and, upon inquiry, he had learned that the trained nurses always had to sterilize alcohol by boiling it (!) before the surgeons dipped their hands in it, preliminary to an operation.

Mr. Cliffe, of Philadelphia, had found, in making such preparations, that by using a good grade of powdered tragacanth, of the authenticity of which he felt sure, and mixing it with the glycerin first, and then adding the other diluent rapidly, it would work nicely and save time in the process.

The chairman suggested that in making a solution of pepsin, if there be any glycerin in the formula, it is well to rub the pepsin in a dry mortar with the glycerin first. And this practice could be carried throughout all pharmaceutical work; where anything agglutinates readily in contact with water, if glycerin is also part of the formula, the water should be withheld until the substance is thoroughly mixed with the glycerin and then the water should be added.

Mr. Searby suggested that a little alcohol mixed with the tragacanth in the preparation referred to (by Mr. Cliffe) would keep it from lumping.

Mr. Eliel, in preparations of this nature, preferred a mucilage of Irish moss, or a mucilage of quince-seed and flax-seed combined, as making a more satisfactory lubricant than tragacanth. Certainly his customers, who were quite critical, preferred to have toilet articles calling for tragacanth substituted by something else. If it is a little thick on the hands it will roll up, which is not the case with flax-seed or Irish moss, or quince-seed mucilage. He thought that if such formulas were to be given out, those should be picked out that gave the best results.

The author of the paper said that there seemed to be some misapprehension on the part of the speakers as to the nature of the use of the lub-

ricant suggested ; that the idea was not to immerse the glove in the anti-septic solution at all, but the physician was simply to dip the ends of his fingers in the lubricant and then slip the glove over it. The glove was to be sterilized before use. The lubricant was to be used for the purpose of getting the glove on the hand, but was not supposed to come in contact with the wound.

The paper was then received and referred for publication.

Mr. J. L. Lascoff then presented the following paper on the subject of "Practical Experience in Dispensing."

PRACTICAL EXPERIENCE IN DISPENSING.

BY LEON LASCOFF.

In my long experience in dispensing prescriptions I have noticed that the same mixture or the same salve dispensed by two different pharmacists according to the physician's order (prescription), will very often look different or will have a different color. This condition is due partly to carelessness in washing the utensils or graduates, or spatulas, and partly it is due to putting up the prescription exactly in the order as written, by beginning with the first ingredient and following up till the last, not thinking that some chemicals will not mix with others, or some chemical change will take place.

I have a good many examples, but shall take up only very few. We will begin with mixtures :

R Potassii iodidi	3ij.
Spir. aetheris nitrosi	3i.
Liq. ammon. acetatis	3ij.
Potass. citratis ...	3j.
Aquæ q. s. ad.	3vj.

If this be dispensed in the order named, the mixture will have a reddish color, but if the potassium citrate be dissolved in water, the ammonium acetate solution and spirit of nitre then added, and finally the potassium iodide previously dissolved in water, a clear colorless mixture will result.

R Zinci sulphatis.	
Potass. sulphurat.....	aa 3 ss.
Aq. rosæ	3vj.
Sig.—Use externally.	

This lotion is known as *lotio alba* ; if properly put up it must be white, otherwise it may be of a grayish color. The best way to dispense this recipe is to dissolve the zinc sulphate in 3 ozs. of rose water and filter. Then rub up thoroughly the sulphurated potassa in a mortar (care must be taken that the mortar is clean) with 3 ozs. of rose water and filter. Then mix gradually both solutions in a mortar and triturate until it forms a white mixture.

Very often we have prescriptions for zinc sulphate, lead acetate and water. The best way is to make a solution of zinc sulphate and add a little mucilage of acacia. Then a solution of lead acetate, and add a little mucilage of acacia, and mix both solutions together. This will keep better and the patients will get better results, and it can be better used with a syringe for injections, for there will be no precipitate.

In making a solution of zinc chloride it never turns out a clear solution, but by adding a few drops of diluted hydrochloric acid you will get a nice clear solution.

In making an emulsion of creosotal (or creosote carbonate) *sometimes* the emulsion assumes a reddish color. This prescription was brought back and I put up a new one and it was perfect. The third time a reddish color again appeared. Several of my friends have had the same experience.

After a few experiments with the creosotal emulsion I found that by first making an emulsion of oil of sweet almond (using as much oil as creosotal is called for), and then adding the creosotal, the mixture will keep better and there will be no precipitate.

In making Hebra's diachylon ointment the salve is often of a brownish color and hard. This salve could be made white and soft if put up the following way :

Melt the lead plaster with the olive oil, strain and put in a *clean* mortar, rub well and add a few drops of water, then add the oil of lavender.

In eye salves, when yellow oxide of mercury or red oxide of mercury is prescribed it is advisable to use Merck's, for it is much *finer*, and when prescribed with vaseline, it is also advisable to use the vaseline from *the tubes*, for it is more sterile. We must keep in our minds that it is used for granulated eye-lids, and the salve for such use should be thoroughly clean and *uniform*.

It will be found difficult to make a satisfactory cucumber cream by strictly adhering to the following formula :

Oil of sweet almond	4 OZS.
Spermaceti	1 OZ.
White wax	1 OZ.
Cucumber juice.	2 OZS.

as the mixture will be too watery, but by adding 15 or 20 drops of liquid albolene and rubbing thoroughly in a mortar a perfectly soft and smooth creamy mixture will result.

A few drops of albolene could always be added to a salve when some watery solutions like sol. adrenaline chloride or rose water and lanoline are prescribed, as albolene assists in making an emulsion.

Besides the thousand different ready-made tablets which are at present on the market, very often we have special tablets to make, triturates or compressed.

The triturate tablets are not always easy to make in a tablet mould if we do not use the right solution or excipient.

In making tablets of pure codeine we must use a mixture of alcohol and water, more water than alcohol, because the pure codeine is very soluble in the alcohol. In making tablets of codeine sulphate, a mixture containing more alcohol than water must be used. In making tablets of calomel and soda, pure alcohol only is advisable, even absolute alcohol, else the tablets will turn black. In making tablet triturates containing extracts, like tablets of extract of ergot (Squibbs) $1\frac{1}{2}$ gr., ether must be used, otherwise it will form a full mass, and we will never be able to take the tablets out of the mould.

To make compressed tablets, *ex tempore*, like lithium benzoate, 7 grains, or sodium sulphocarbolate, 4 grains, we must rub up the ingredients called for in mortar with mucilage of acacia, granulate through a coarse-mesh sieve, let the granules dry and compress in a tablet machine like that made by Whitall, Tatum & Co. The idea of granulating the chemicals is that they shall not stick to the mould and the tablets shall all be uniform and have the right weight.

Mr. Eliel moved to receive and refer the paper just read.

Mr. Wilbert thought that the use of hydrochloric acid was not always to be recommended for clearing up solutions of zinc chloride, as great care should be exercised where the solution was to be used on any portion of the mucous membrane. The same effect can be obtained from the use of boric acid, and a majority of the eye specialists at the present time are prescribing zinc chloride in saturated solution of boric acid.

The chairman thought there was no objection in such cases to the use of diluted hydrochloric acid, when not used in excess. If the solution is turbid, enough to clear it can be used. It is the presence of zinc oxychloride that causes the turbidity, and only enough of the diluted acid should be used to almost clear the solution. As to the matter of compressed tablets, he did not advocate the use of mucilage of acacia in all cases. The tablet must disintegrate sometime, and if acacia is used in many instances it never will. He was accustomed to use a little starch and starch paste in the tablet mixture, although nearly every tablet requires a different treatment.

Mr. Searby related an experience in dealing with prescriptions calling for spirit of nitre, potassium iodide and wine of colchicum, where the mixture exploded the bottle in an hour's time. A series of experiments in attempting to solve the cause of the trouble finally led him to the conclusion that there was just enough acetic acid in the wine of colchicum to decompose the potassium nitrite that was formed.

The chairman called attention to the fact that he had stated before this Section several years ago that nearly all tinctures and preparations of organic drugs are acid in reaction.

The Chair stated that there were two short papers that might be presented at this time, one by Mr. J. B. Moore, on a dose dial, and the other by the same author on the subject of a duplicating prescription-blank. He asked Mr. Mayo to read the papers:

THE DOSE DIAL.

BY J. B. MOORE, PHILADELPHIA, PA.

The "Dose Dial" is an inexpensive yet very useful little gift that the pharmacist can present to his customers and one that will be fully appreciated by them. Though small and rather insignificant in appearance, they are really quite important and highly useful in the sick chamber. Being inexpensive, the pharmacist will feel justified in distributing them freely, especially amongst his prescription customers. The dial consists of an aluminum clock face about the size of a quarter dollar, with one hand.

The presentation of these desirable little articles will secure for him many new prescription customers, at least that was my experience with them. They have a tendency to make you more popular, and will advertise your store, as every little act of this kind will do.

People greatly appreciate enterprise and a liberal spirit in business. It is important, however, for you to give publicity to such matters, and elicit as much attention as possible, and to accomplish this it is necessary for you to have a nicely printed explanatory circular, the same as, or similar to, the form presented below, for general distribution, and to give away with each dial.

To give or send to a customer a useful gift of this kind, or one of a similar character, without calling especial attention to it and explaining its utility, importance and all its merits, or presenting with it an explanatory circular, is to lose much of the benefit of it as an advertisement.

At the counter these dials can be presented to a customer, with a circular, to which special attention should be called, if delivered with a prescription, and with it a circular enclosed in an envelope, which has been sealed and addressed:

To My Prescription Customers:

Permit me to present the enclosed "Dose-Dial" Time Indicator, a neat and unique little contrivance which I have had made for my prescription customers, and which I think will prove to be a very useful and convenient, if not an indispensable, requisite to the nursery and sick chamber. The point which is strongly attached to the dial may be thrust into the top of the cork of the bottle containing the medicine, or it may be similarly inserted into the top, or other available part of a powder or pill-box, or it may be stuck into any adjacent object, and the dial so adjusted as to be conveniently seen, and the hand on the face of the dial placed to point the hour when the first dose should be taken. The hand should be shifted after each dose in order to indicate the hour at which the next dose should be administered. The presence of this little instrument in the sick chamber will, I have no doubt, contribute to promptitude and regularity in the *taking* and in the administration of medicine.

PHYSICIANS

will at once recognize and appreciate the utility and advantage of this cute little dose "Time-Keeper." We desire that every one of our prescription customers should have one of these useful sick-chamber requisites. Those who have not already received one will cheerfully be presented with one by asking for it at the time of having a prescription prepared.

Yours truly,

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THE DUPLICATE PRESCRIPTION-BLANK

BY J. B. MOORE, PHILADELPHIA, PA.

The pharmacist who desires to court the friendship and prescription patronage of physicians, and in aid of such efforts desires to occasionally send some nice present or gift, at Christmas or at other auspicious times, and especially to those who are already friendly and liberal patrons of the store, should endeavor to select an article that is sensible and practically useful, something that the intelligent physician will gladly accept and appreciate; perfumery, fancy goods, toilet articles, etc., many physicians do not use and care but little for, unless they have families, so the favor is but little appreciated and is soon forgotten, but neat prescription-blanks are always useful, and are generally acceptable to all.

There is, however, a kind and style of prescription-blank, which is unique and of unusual utility and value. It seems strange that they are not in more general use, but this is owing to the fact that many physicians have never seen nor heard of them and are not aware of their many advantages over the ordinary blank. I refer to the carbon-paper duplication blank. Any clever printer could no doubt prepare them.

My attention was first called to them a few years ago by a prominent pharmacist of Washington, D. C., the late William S. Thompson; he had introduced them, and physicians seemed to be much pleased with them, in fact, they became immensely popular.

The advantages they possess over the ordinary blank are so numerous and important that I think every physician in the land should use them. The pharmacist should procure quite a large number and send a suitable supply to each *desirable* physician with the following letter, which should be typewritten, on good paper and in good style, in order to command their respect and attention. These should be enclosed in a sealed and addressed envelope.

PHILADELPHIA, ——— —, 190 .

Dear Doctor: I send you herewith a number of handy prescription tablets with carbon paper, which I think you will find especially desirable, as they will enable you without trouble to keep a copy of every prescription you write. This correct record of your daily work can thus be preserved for convenient reference at all times, and even for years to come, if you choose to save the tablets. By this means you can preserve many valuable prescriptions which otherwise might be forgotten, or if remembered the proportions of the ingredients might be lost to the memory.

Furthermore, it often happens that a patient returns for treatment of a malady for which he has been treated successfully by you a year or so before, and you find your present treatment unavailing. You may then wish that you could remember the course of medication that you had previously used with such magic results.

Again, it would be a great satisfaction to you in your daily round of duty, and while meditating on the treatment and condition of your cases, to be able to refer to this tablet and find therein a complete record of your work for days or weeks past. You could thus, in going from case to case, formulate your course of treatment by the time you reached the bed-side of your patient, which, however, in acute cases, might have to be modified a little in obedience to the ever-changing conditions and symptoms.

The advantages of preserving copies of prescriptions may be gained by having your druggist copy the prescription on the label, but this you do not see until you reach the bedside of your patient, and this copy may have but a very ephemeral existence. Besides, this practice entails upon the busy pharmacist a delicate and unpleasant duty, as it often takes almost as much time to copy a prescription of many ingredients as it does to compound it.

There is still another advantage that may accrue from the use of the "duplicating blanks," namely, prescriptions are often written amidst interruptions and during perturbed mental conditions, perhaps when you are overworked and weary. After the prescription has been handed to your patient and he has departed, it may occur to you that possibly you have made a mistake, either in writing the ingredients or in their proportions. This feeling of distrust may haunt and worry you for hours, and especially so if the medicine is of a potent or noxious character. At times you would give almost anything if you could free yourself from this tormenting phantom of doubt. It is a delicate and often perplexing task to investigate such matters. Now, if you use the "duplicating blanks," all you would have to do would be to refer to this absolutely correct record where you could at once either confirm your suspicions or relieve your mind of all uncertainty.

Yours respectfully,

On motion of Mr. Boring, these papers were ordered received, to take the usual course.

On motion of Mr. Searby, the Section then adjourned to 8 o'clock to-night.

SECOND SESSION—TUESDAY EVENING, SEPTEMBER 3, 1907.

Chairman Dunning called the Section to order at 8 : 20 p. m., and called for the reading of the minutes of the first session.

On motion of Mr. Wilbert, the reading of the minutes was dispensed with.

The Chair announced that the election of officers of the Section for the ensuing year was the next order of business, and Mr. Diner moved that the Secretary be instructed to cast the affirmative ballot of the Section for the candidates nominated at the first session, but accepted an amendment proposed by Mr. Wilbert, that Chairman Dunning perform this duty, as the Secretary (Mr. Weinstein) was in nomination to succeed himself in that office. This motion was seconded by Mr. Boring. Mr. Scoville, one of the nominees for Associates, asked if it was the custom to have two

associates on the committee, and was assured by the Chairman that it had often been done, and Mr. Eliel stated that it was entirely proper to do so.* Thereupon the motion as amended was put to a vote and carried, and the Chair announced that he had cast the ballot for the Section for F. M. Apple, of Philadelphia, as Chairman; Joseph Weinstein, of New York, for Secretary; and for Messrs. E. Fullerton Cook, of Philadelphia, and Wilbur L. Scoville, of Boston, for Associates upon the Committee, and declared these gentlemen duly elected.

The reading of papers was called for, and Mr. Apple presented the following paper on "Counter Prescribing and Dispensing":

COUNTER PRESCRIBING AND DISPENSING.

BY FRANKLIN M. APPLE.

It is indeed with great caution that I attempt the discussion of this time-worn subject, which has been the constant cause for considerable ill-feeling between the members of our calling and those of our sister profession—medicine, and I do so solely with hopes that less animosity may exist after a clearer understanding of the subject.

The pharmacists are accused, by the medical men, of being the cause of the ill-feeling resulting from counter-prescribing and dispensing.

Are they as black as they are pictured, and are the circumstances which surround the acts of offence perfectly understood by the accusers?

I do not think that the great majority are of as dark a hue as they are painted, and most frequently the accusations are made without any attempt being made to ascertain the conditions surrounding the acts of offence, by the accusers.

It is absolutely necessary to bear in mind the facts that the pharmacists are expected to show a neighborly and humanitarian spirit towards their fellow-men when in distress; and their special training makes them the objects of greater demands from their neighbors; hence, consideration must be shown them for their, in many instances, unenviable positions. Most certainly his neighbor to the east of him can expect him to offer as valuable advice as the neighbor looks for from his other neighbors, who have had no special training in the fields of pharmacy and medicine, and no medical man can honestly object to the pharmacist's responding to the appeals of his neighbors *to the extent only that the other neighbors, without special knowledge on the subject, most willingly would suggest and supply upon request.*

I have noticed recently in articles appearing in medical journals that a

* The By-Laws prescribe that there shall be one associate on the Committee on Practical Pharmacy and Dispensing, and hence the election of two associates was an error.—THE GENERAL SECRETARY.

number of the leading men of the medical profession have voiced their sentiments upon the subject of the pharmacist's advising and supplying simple remedies for simple maladies in the proper spirit, as they acknowledge the frequent *compulsion* of the pharmacists to offer advice and aid for minor maladies.

The following will illustrate these sentiments :

"I do not wish to be understood as objecting to the druggist advising the use of a cathartic or some other simple remedy, as he is occasionally *forced to do*. When he attempts the treatment of more serious conditions, including "sore throat," that may be diphtheritic, the administration of his own, or somebody else's patent medicine, headache powder containing dangerous coal-tar products, then I think he descends to the class of the quack doctor, who uses the cloak of an honorable calling to defraud suffering humanity.

"In attempting the treatment of venereal diseases the druggist speaks lightly of them to the patient, assures him that some mixture that he has for sale will cure the condition readily, and thus prevents the patient from seeking competent advice that might save him much future suffering and unhappiness."

DR. G. MORGAN MUREN, *Brooklyn, N. Y.* (Critic and Guide, May, 1907.)

"That while the exigencies of business *compel* the druggist to sell 'patent medicines,' yet these ought to be kept in the background as much as possible. Useful domestic remedies and non-secret preparations, *the pharmacist may dispense without subjecting himself to criticism by physicians.*

"That the prescribing of nostrums causes the druggist to lose faith in the knowledge of the prescribing physician and to believe himself as well qualified to treat disease, with the result that the pharmacist is led to counter prescribe and the medical practitioner ultimately to dispense, both evils that should be eliminated."

DR. GEO. H. SIMMONS, *General Secretary of the American Medical Association.*

"A. Ph. A. Bulletin," February, 1907.

In the rural districts circumstances compel the physicians to carry with them their medicines and appliances constantly, to which the pharmacists offer no objections, as they realize the verity of the old adage—"Circumstances alter cases." Similarly so circumstances frequently compel the pharmacist to advise and dispense.

Very often the pharmacists are compelled to use great diplomacy in meeting the demands of their patrons for advice and medicine, and by satisfying their demands gain their perfect confidence, making it possible to advise them to consult a medical practitioner if the simple remedy offered them does not fully meet their cases, instead of resorting to one or more of the innumerable patent medicines that are advertised as panaceas—some for all ills flesh is heir to, and others for special maladies only.

The medical profession must not lose sight of the vast number of these patent medicines, with "doctor's" names attached thereto to give them greater therapeutic values, also the large assortment of remedies that can be classed with the aforesaid remedies, that were introduced solely through the agency of the medical profession, to the laity, by their prescribing

original packages of the same for their patients, and frequently by advising the purchase of a package of them as a proprietary medicine, so as to save the patients a few cents in the cost, at a cut rate store, which the human race are led to believe are infallible ; hence, if the pharmacists can convert prospective patent medicine users into patients for the medical men by satisfying a request for medical advice for a minor ailment with a simple remedy, *properly labeled and dispensed*, he has proven a benefactor to his customer and the medical profession has gained a prospective patient.

I have intentionally stated *properly labeled and dispensed*, as I wish to emphasize this feature of the transaction, for I deem it the keynote of the entire matter.

Only dispense simple remedies such as paregoric, castor oil, ess. jamaica ginger, sweet spirit of nitre and similar household remedies, with no other directions than the customary ones printed upon the label, for, by so doing, you have not taken advantage of the special training you acquired as a pharmacist—having given just such advice as the other neighbors would have given your neighbor (save possibly the innumerable patent medicines many of them would have suggested), thereby satisfying the customers' demands and retaining their confidence to the extent that after your advice and remedy has not given perfectly satisfactory results, they will accept, willingly, your advice to consult their medical practitioner.

Repeatedly I have had the satisfaction of so diverting customers who came into my store intent upon dosing themselves with patent medicines ; and my medical practitioners, who later have treated them, have commented upon the wisdom of my having done so, as some of these patients were sadly in need of good medical advice and treatment. Many of the customers have expressed their gratitude for the advice offered to consult a reputable physician. In the majority of these cases they would not have gone directly to consult a medical practitioner, as I had not their confidence quite sufficiently to convince them of the wisdom of such a course.

Owing to the flagrant abuse of the hospital and dispensary benefits by the laity, (and unfortunately frequently by some of the medical practitioners) it requires considerable tact and diplomacy to divert an imposter upon charity to the proper parties, in self-defense to the commonwealth, the worthy poor, the medical profession, and those of our calling. Such efforts give rise to considerable of the so-called unjustifiable counter prescribing and dispensing, hence should be carefully and charitably considered by the medical practitioners.

The practice of having a non-secret (so-called) remedy for almost all maladies is not to be condoned, as it is but a feebly masked method of direct counter prescribing and dispensing, savoring of the methods of a

number of our most popular selling patent medicines proprietors, *i. e.*, Munyon, Humphrey's, etc.

Where such practices are followed the support of the medical men can hardly be expected.

Until it can be definitely settled as to where counter prescribing begins and ends this cause of friction between the sister-professions will remain, and I believe it will be as difficult to determine this question to the satisfaction of the entire profession as it is to decide where green stops and yellow begins in the spectrum; but let us endeavor to be as tolerant as circumstances will permit, avoiding mutually any and all practices that our consciences dictate are improper and illegal—for prescribing without a license is illegal, and it is to be presumed that the medical practitioners, through special training, are better qualified to diagnose and advise than pharmacists; hence are the proper parties to do so intelligently.

Let us reduce our counter advising and dispensing to the minimum that circumstances will permit, ever mindful of the facts that our training has been to *prepare* and *dispense* medicines, and not to *diagnose* and *prescribe*. Let us get together more in the future than we have done in the past for we need one another's aid and support.

Mr. Wilbert moved to receive the paper and refer to the Publication Committee.

Mr. Diner argued at length against the practice of counter prescribing, and took the position that there was no middle ground in the matter; the pharmacist should absolutely refuse to do so in any case where a diagnosis is required, even though the ailment should appear to be slight, for a mere headache may be the forerunner of typhoid fever, or a slight sore throat the forerunner of diphtheria. The fact that some physicians dispense does not make it right for some pharmacists to prescribe. The observance of this rule will bring about more friendly relations with the physicians.

Mr. Hynson thought the paper of Mr. Apple was so well written that it was hard to criticize it, and he fully endorsed the position taken by Mr. Diner. There should be no compromise with this evil of counter prescribing.

Mr. Hallberg concurred in the remarks made by Mr. Diner, but read from the pages of a recent issue of *American Medicine*, on the subject of "The Need of a Third Profession," to show what startling views come sometimes from the most unexpected sources. A line seemed to be drawn between the poor and the rich, whereas the poor ought to be entitled to just as good medical treatment as the rich, especially in this country. This seemed to represent the so-called apothecaries in England, but whether the system had been found to be useful and safe he did not know, though he doubted it.

Mr. Diner said that such a condition as the so-called "third profes-

sion " undoubtedly did exist in the City of New York, and they had there a number of cheap physicians and cheap pharmacists combined in one. They had there twenty-five and fifty-cent dispensaries, where the people were herded together like cattle and treated a little worse, and where the chief aim was to give a bottle of medicine that looked big enough to extract half a dollar from the pocket of the victim, and which cost little enough to allow it to be given away if necessary. These institutions thrive in spite of the fact that there is not a physician so small that he would not give free medical advice to those in need who could not afford to pay for it. He reiterated his expression of opinion that the medical and pharmaceutical professions should be kept separate and distinct, each working in its own proper sphere. This is the day of specialization; it is notably true of medicine and surgery, and pharmacy is moving in that direction, and the time will probably come when specialization in pharmacy will be as important as in medicine. The real duty of the pharmacist is to become a specialist in that branch of medicine known as pharmacy. When he attains the position of specialist, the majority of physicians will refrain from specifying this, that or the other thing, and will send their patients to him because of his professional knowledge and skill in compounding.

Mr. Searby, referring to the remarks of Mr. Hallberg, said he wanted to correct a possible mis-impression as to the situation in England; that in Great Britain they have what are known as licentiates of the Apothecaries' Society, but every man before he can obtain that license must pass an examination equal to that which the physician must pass in this country, an examination in every branch of medical science, not excepting even surgery. Mr. Searby made a plea for the poor druggist, living among poor people, who came to him with their little ailments, and whom he could not turn away. The poor doctor, too, in such districts, can only practice among the poor, and he is fortunate in many cases to be able to collect a fee of twenty-five or fifty cents for a visit. Those who live amid more favored surroundings should remember this, and not attempt to legislate for this class.

Mr. Hallberg said this was really more a question for the Educational Section than for this Section, and as Dr. McCormack, of the American Medical Association, was to address that Section along this line, he thought it wise to defer further discussion until it would come up before that Section.

The paper was then received and referred for publication.

Mr. Otto Raubenheimer read the following paper on "Magma of Magnesia," exhibiting three samples of his product:

MAGMA MAGNESIÆ.

BY OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

My first attempt at preparing milk of magnesia, years ago, followed the easy way, which was to hydrate the light calcined magnesium oxide; the heavy oxide, of course, would not do. This, however, never gave a satisfactory preparation owing to the fact that magnesium oxide, especially if kept in a can, absorbed carbon dioxide, and did not then hydrate as well. Furthermore the carbonate present is objectionable. It also was observed that milk of magnesia prepared in this way always had a gritty taste, even if prepared according to Dieterich's method with the addition of about 25 per cent. of glycerin.

What is wanted is a smooth preparation containing the freshly precipitated magnesium hydroxide suspended in water in a finely divided condition.

In "Pharmaceutical Formulas," 1899, page 520, Peter MacEwan, the editor of "The Chemist and Druggist," states that lac magnesiæ from magnesium sulphate and liquor potassæ has been used in Edinburgh since the "fifties." The latest revision of the National Formulary (1906) gives a very good formula for a preparation containing about 5 per cent. precipitated $\text{Mg}(\text{OH})_2$ under the name of Magma Magnesiæ. I have been experimenting with this formula and beg to submit the following suggestions:

Sodium hydroxide evidently is used in place of potassium hydroxide, because the sodium sulphate formed is more soluble than potassium sulphate, and therefore can be washed out more readily. The quantity of magnesium sulphate, 250 Gm., is somewhat in excess. If sodium hydroxide were in excess it would be difficult to wash out. 81 Gm. of sodium hydroxide, containing 90 per cent. of NaOH , equals 72.9 Gm. NaOH 100 per cent., and requires $224 \text{ Gm. MgSO}_4 + 7\text{H}_2\text{O}$ to form 53 Gm. $\text{Mg}(\text{OH})_2$ in 1000 Cc. magma magnesiæ. I have been using only 240 Gm. magnesium sulphate, and thus have 10 Gm. less to wash out. The water must be free from organic matter, and must also be free from iron, or the precipitated $\text{Mg}(\text{OH})_2$ will be discolored. Distilled water would, of course, be best, but as large quantities have to be used the preparation would be more expensive. I use ordinary hydrant water, but I filter it through a Berkefeld filter, consisting of a cone of Kieselguhr or infusorial earth, which removes organic or other impurities.

As suggested by Professor Scoville (Proc. A. Ph. A., vol. 51, p. 399), 2 grains of alum to the gallon of water will also precipitate the excess of organic matter. The National Formulary only states that the water must be free from organic matter, but gives no method of freeing it. The National Formulary should also specify that the water must be free from iron, which is very important.

Now as regards the *modus operandi*: instead of filtering the two solu-

tions through paper I filter them through cotton, as the alkali solution is destructive to filter paper. Before mixing the two solutions I set them aside in a cool place. The colder and more dilute the solutions are the finer and bulkier is the precipitate. Instead of decanting the liquid and also the washings from the $\text{Mg}(\text{OH})_2$, I syphon them off, because I can remove them more completely and at the same time do not disturb the precipitate. This syphon should not be too large in diameter or it will create too much suction and carry along some of the $\text{Mg}(\text{OH})_2$. The National Formulary orders the precipitate transferred to a muslin strainer, then drained and mixed with enough water to make 1000 Cc. This method has the disadvantage of allowing a loss of some of the $\text{Mg}(\text{OH})_2$, by passage through the strainer as well as being retained on it. Furthermore the magma is liable to become full of dust and also to absorb carbon dioxide from the air, which is not wanted in this preparation.

I find the following a more successful and easier method: I pour the precipitate after syphoning off the wash water—two washings will usually remove the saline taste—into a one-half gallon bottle with a mark at the 1000 Cc. point. After the precipitate has entirely subsided, I again syphon off all the wash water, fill the bottle with distilled water, shake and set aside. When the precipitate has fallen to the 1000 Cc. mark I syphon off the water up to 1000 Cc. mark and the milk of magnesia is finished. The reason I use distilled water for the last washing of the precipitate is that distilled water has a more solvent action on salts and if there are any left in the precipitate the distilled water will take them up. This distilled water should also be free from CO_2 to prevent the formation of magnesium carbonate.

Regarding the name "Magma Magnesiae": magma is derived from the Greek word μάλα, a salve, which is derived in turn from the verb μάσσειν, to knead; magma therefore means a "kneaded mass" or "dough." The precipitated and drained $\text{Mg}(\text{OH})_2$ could be called a magma. But is it proper to call it a magma after it is mixed with water into a fluid?

Magnesii hydroxidum præcipitatum pultiforme would, of course, be a long name, but it would justly describe the preparation and could be abbreviated to magn. hydr. præc. pultif.

The cost of 1000 Cc. of milk of magnesia made by this process may be estimated as follows:

240 Gm. Epsom salt, 1½ cents per pound	1 cent.
81 Gm. sodium hydroxide, 25 cents per pound	4 cents.
1000 Cc. distilled water	3 cents.
Total	8 cents.

Which certainly represents a difference from the wholesale price of the proprietary preparation of 36 cents per 12 ounce bottle. Besides the sav-

ing effected the manufacture of this elegant preparation should be a pleasure to the real pharmacist.

August 20, 1907.

Mr. Diner moved to receive the paper and refer for publication.

Mr. Joseph L. Mayer asked the writer if he had ever had any experience with glycerin. A case had been submitted to his laboratory not very long ago where carbon dioxide had been found in the preparation, possibly due to exposure to the air; he suggested the use of glycerin, and no trouble had been reported since.

Mr. Raubenheimer said he had made the preparation repeatedly in 1000 Cc. lots since the National Formulary had come out and never had any trouble, but he always kept a layer of water on top of the preparation. He did not think glycerin would be very desirable to mix with it. He thought the carbon dioxide must have been absorbed from the air.

Mr. Cohn was reminded on listening to the paper that he had made this preparation of magnesia twenty-five years ago by a somewhat similar process, the exact quantities and the details of which he had forgotten. He knew he had used dialysis in the operation, with fine results.

Mr. Wilbert criticized the author's suggestion of the use of a definite quantity of alum in the water to precipitate the organic matter, and said that unless the amount of organic matter was known, so as to know the exact quantity of alum to use, the organic matter would not be gotten rid of. He thought the resulting magna should be washed in distilled water, in fact, distilled water should be used more liberally by pharmacists than is the custom.

Mr. Hallberg differed with Mr. Wilbert, and said it was the amount of lime in the water that caused the decomposition, and the amount of alum required is proportionate to the amount of lime present in the water. This he had very clearly demonstrated in Chicago, in connection with Lake Michigan water, where, formerly, it had required one gramme of alum to five gallons of water, that is, three grains to the gallon, but now since the completion of the great drainage canal there, the amount of lime in the water has been reduced one-half, and it only takes half the amount of alum to accomplish the same result.

Mr. Raubenheimer reminded Mr. Wilbert that this was Mr. Scoville's suggestion as to the use of two grains of alum in the water, not his own, and he had so stated in his paper. He added that Professor Schmidt, of Marburg, an honorary member of this Association, had said that alum was not a good purifier.

The Chair suggested that if distilled water were used the expense would be greatly increased, as it would take immense quantities of it to make a small quantity of milk of magnesia.

The paper was then received and referred for publication.

The next paper called for was one by Mr. Stevens on citro-compounds

of iron, which the writer presented in abstract, the following being the full text of the paper :

CITRO-COMPOUNDS OF IRON.

BY A. B. STEVENS.

This class of preparations was introduced in the year 1873 by J. L. J. Creuse who affirmed that ferric salts, without exception, form green soluble compounds with the alkali citrates, tartrates and oxalates ; also that the iron is not affected by the usual iron reagents unless acidulated with mineral acids, and is not decomposed by cinchona bark. He prepared what he called "tastless" chloride and iodide of iron, which have since been used to a considerable extent.

Citro-chloride of Iron. A formula for the preparation of a tincture of the citro-chloride of iron appeared in the New York and Brooklyn Formulary in the year 1884. It has also appeared in each successive edition of the National Formulary, with few changes. The amount of sodium citrate has been decreased. In 1884 the amount was equal to 485 Gm. of sodium citrate to 250 cubic centimeters of solution of ferric chloride. In the edition of 1888 the amount of citrate was reduced to 460 Gm., which amount was given in the first copies of the 1896 edition. Later it was reduced to 410 Gm. In the present edition the formula requires 410 Gm. of the citrate for every 350 Cc. of the solution of chloride of iron, but the strength of the solution has been reduced from 37.8 per cent. to 29 per cent., so that the proportion of sodium citrate to iron chloride has undergone but slight reduction.

Citro-iodide of Iron. This preparation has usually appeared in the form of a syrup, the formula for which has been given in each edition of the National Formulary though it has been changed with each edition and is still unsatisfactory. Theoretically the present formula is correct ; practically it is incorrect. In order to clearly understand the difficulties and the method of overcoming them, we should bear in mind that ferric iodide of iron does not exist under ordinary conditions. Rother (Pharm. 1876, p. 195) claims to have prepared it but states that it is very deliquescent, and is immediately decomposed by water into ferrous iodide and free iodine.

Iodine must be present in amount sufficient to form a ferric salt, as the iron in the finished syrup is in a ferric condition. The first step in the manufacture is the formation of ferrous iodide. To this is added one part of iodine for every two parts of iodine in the ferrous iodide. The ferrous iodide merely dissolves the iodine. That the iodine is free may be proven by the fact that it can be entirely removed by chloroform, carbon disulphide or starch ; or it may be estimated by direct titration with sodium thiosulphate solution. If the iodine and the ferrous iodide exist in the right proportions, a sufficient amount of potassium citrate will change the color to green. If iodine is in excess the color will vary from

yellowish-green to brown, depending upon the amount of free iodine present. The excess of iodine may be easily determined by titration with thiosulphate solution. In the formula given in the year 1888, the iodine existed in theoretical proportions, but frequent complaints were made that the preparation failed to become green. This we know was due to the presence of free iodine. In the next revision of the Formulary the proportions were changed to one part of free iodine, to three parts of iodine combined as ferrous iodide. Here we have the opposite effect. All the iron was not changed to the ferric form, and the ferrous iron in the finished syrup rapidly darkened. In the present edition we again have the theoretical quantities, and again we have free iodine in the finished preparation. To confirm this, the syrup was prepared by three competent pharmacists, each of whom was requested to prepare it with the greatest possible care, and to weigh the iodine upon torsion balances. The resulting syrups were light-green in color, with a slight tinge of yellow, and were found to contain 44.6 Mg., 45 Mg., and 45.75 Mg. of free iodine in 100 Cc. of syrup.

The failure to produce a satisfactory preparation from the theoretical formula may be attributed to two causes. First, the difficulty in preventing a slight loss of iodine in the manufacture of the ferrous iodide. Second, to loss of ferrous iodide due to imperfect washing resulting from the small amount of water allowed for that purpose. By increasing the amount of wash-water, the free iodine is reduced to 29.5 Mg. in 100 Cc. of syrup. To prepare a perfect working formula the writer recommends that the 32 Cc. of warm distilled water (N. F., line 5 from top of page 158), be increased to 125 Cc., and the water used to dissolve the potassium citrate (line 8 from top of page 1, be reduced to 100 Cc. Then before adding the sugar, add 10 Gm. of powdered starch, shake thoroughly, and filter. This removed the free iodine and the iron will be sure to appear in the ferric condition.

CHEMICAL COMPOSITION.

The writer believes that the name applied to this class of preparations is incorrect, and that the above preparation is not citro-iodide of iron, but that the iron is present as potassium ferric citrate similar to the double citrate, tartrate, etc. Doubtless the iodine exists as potassium iodide. Creuse (*Am. J. Pharm.*, 45, p. 214) states that the ferric iodide plays the part of an acid, and the alkali citrate plays the part of base. He also states that three atoms of iodine require two molecules of citric acid as potassium citrate. Rother claims that when potassium citrate and ferric chloride are mixed, only potassium chloride and ferric citrate can result, and proves that all the chlorine, and all the iodine in case of the iodide, may be separated by dialysis. In a foot-note, U. S. D., 19th edition, p. 494, we find "R. Rother affirms that these so-called salts are mere mix-

tures of iron citrate and iodide or chloride of the alkali used (A. J. P., 1876, p. 171)." From a careful study of the article referred to it appears that while the author clearly states that all iodine or chlorine appears in the form of potassium iodide or chloride, and proves that it can all be removed by dialysis, he also proves that the iron is present as a double citrate of iron and potassium. He further states that "a mixture of ferric chloride and tripotassic citrate in certain proportions becomes green, and it was found that twice the equivalent amount of monadcitrate was required to produce the result." The author adds that there is an intermediate change which "the pale-yellow ferric chloride solution assumes in contact with the citrate a preliminary red which by continued addition of the citrate gradually and completely changes into green." Owing to the rather strong character of the citric radical and its tendency to form double salts, the latter property is exerted before entire double decomposition is effected, hence, in order to insure this completely, sufficient monadcitrate must be present to form a double salt with the ferric citrate to be produced. This is very clearly seen from the following equation: $\text{Fe}_2\text{Cl}_6 + 4(\text{K}_3\text{C}_6\text{H}_5\text{O}_7) = 6\text{KCl} + 2(\text{FeC}_6\text{H}_5\text{O}_7)\text{K}_3\text{C}_6\text{H}_5\text{O}_7$. From the above we gather that the initial changes are the formation of potassium chloride and ferrous citrate, which is red, and the final change is the formation of the double potassium and iron citrate, which is green. This is further proven by the fact that after the removal of the chloride by dialysis there remains a green compound. While it is my opinion that the iron appears in the form of a double salt, I am satisfied that the formula given is incorrect. The proportion of two equivalents of the citrate to three of chlorine or iodine necessary for the above equation, requires 102.3 grams of citrate for 60 grams of iodine to produce the required green color. The amount of potassium citrate given in the National Formulary for 60 grams of iodine is 85 grams, which is equivalent to $3(\text{FeI}_2 + \text{I}) + 5\text{K}_3\text{C}_6\text{H}_5\text{O}_7$. By careful work the writer finds that it is possible to reduce the amount of citrate to 77 grams for 60 grams of iodine, which is in the proportion of $2(\text{FeI}_2 + \text{I}) + 3\text{K}_3\text{C}_6\text{H}_5\text{O}_7 + \text{H}_2\text{O}$. With the chloride I find that 16.104 grams of the anhydrous ferric chloride requires 47 grams of the citrate to give the apple-green color. Theoretically, 48.3 grams of the citrate should be required for $2\text{FeCl}_3 + 3(\text{K}_3\text{C}_6\text{H}_5\text{O}_7 + \text{H}_2\text{O})$. The difference between the theoretical and practical amounts required may doubtless be attributed to the water present in the ferric chloride used. It is therefore evident that the chemical change requires two molecules of ferric chloride, or an equivalent of iodine, for three molecules of the citrate. This would give $6\text{KCl} + \text{K}_3\text{C}_6\text{H}_5\text{O}_7 \cdot 2\text{FeC}_6\text{H}_5\text{O}_7$. The color and chemical behavior would indicate that the potassium and ferric citrates exist in close combination rather than as mere mixtures.

Further investigation of the chemical character of these compounds will be continued as time permits.

School of Pharmacy, University of Michigan.

Mr. Hynson wanted to know of the author if he did not think this matter of sufficient importance to attract the attention of the Scientific Section, and Mr. Stevens replied that he thought future investigation of the subject would be of that degree of importance. He was willing that anybody who desired to do so should take up the subject, and he would like to investigate it himself if he had the time. He thought it was a subject that would naturally come before the Scientific Section.

The Chairman said this was in line with the suggestion made in his address, that such work done in the Section on Practical Pharmacy and Dispensing should be continued by the Scientific Section.

The paper was then received and referred for publication.

The Chair here stated that he had made a collection of prescriptions that had given trouble in dispensing and he intended to present them before the Section at this time, but he had just found out that he had brought the wrong lot with him, and he would have to let these go over to next year. He had, however, noted down two prescriptions that were very interesting to him, one of which called for :

Boric acid	3 grains.
Potassium iodide.....	3 drachms.
Potassium bromide	4 drachms.

These powders, Mr. Dunning said, were rubbed well together and mixed thoroughly, but to his surprise the mixture turned yellow. A number of experiments were made with the same result. He had been utterly unable to learn the cause of this trouble.

Mr. Dunning also presented a prescription calling for

Sodium bicarbonate.....	℥ i
Strontium bromide.....	℥ iv
Sodium bromide.....	℥ i
Syrup of orange	℥ i
Water, sufficient to make.....	℥ iv

and said there was copious effervescence.

The latter prescription was briefly discussed by Mr. Searby and Chairman Dunning, both gentlemen agreeing that the effervescence was due to precipitation of strontium carbonate and consequent liberation of carbon dioxide according to the equation $2\text{NaHCO}_3 + \text{SrBr}_2 = 2\text{NaBr} + \text{SrCO}_3 + \text{H}_2\text{O} + \text{CO}_2$.

Mr. Charles H. LaWall read the following paper on tincture of iodine :

TINCTURE OF IODINE.

C. H. LAWALL.

The frequency with which articles on this subject have appeared in pharmaceutical literature during the past few years, together with the con-

tradictory character of some of the statements made in these articles, and the fact that no actual data are given by many of the investigators, has led to a series of experiments to ascertain the keeping qualities of tincture of iodine under varying conditions.

The rapid deterioration which was observed to take place in the preparation as made according to the U. S. P. 1890 led to the introduction of an improved formula in which potassium iodide was added, not for the purpose of aiding in the solution of the iodine, as is erroneously supposed by many, but for the purpose of minimizing the loss of free iodine which always takes place when the preparation is made with iodine and alcohol alone, owing to a part of the iodine being combined as ethyl iodide or hydriodic acid.

The question as to whether the preparation keeps best in the light or in the dark, is one which has occasioned disagreement between several authorities. Popiel in "Pharmaceutische Centralhalle" for 1895, page 404 states that the tincture decomposes more rapidly in the dark, while Joseph Feil, in the A. Ph. A. Proceedings for 1897, states that it will keep for one month in the light and for two months in the dark without appreciable deterioration.

The author of the present paper determined to try the following experiments. Reasoning that if potassium iodide produced the stability in the preparation which was claimed for it, some cheaper halogen salt might answer equally as well, and it was decided to try the effect of sodium chloride in the formula instead of potassium iodide. Accordingly, three different lots of the tincture were made as follows:

No. 1, by the U. S. P. 1890 process, using iodine and alcohol.

No. 2, by the U. S. P. 8th Revision process, using potassium iodide, iodine and alcohol.

No. 3, using sodium chloride, iodine and alcohol, the sodium chloride being used in the same proportion as potassium iodide in the formula No. 2.

Two portions were separately made of each lot, one for the purpose of exposing to light, the other to be kept in a dark closet.

According to the U. S. P. VIII, 5 Cc. of tincture of iodine should require 27.5 Cc. of decinormal sodium thiosulphate for complete decolorization. The six samples mentioned were assayed and found to be as follows:

Exposed to light.

No. 1, with potassium iodide, 27.60 Cc. decinormal sodium thiosulphate.

No. 2, with sodium chloride, 27.50 Cc. decinormal sodium thiosulphate.

No. 3, with iodine and alcohol, 27.40 Cc. decinormal sodium thiosulphate.

Kept in dark closet.

No. 4, with potassium iodide, 27.90 Cc. decinormal sodium thiosulphate.

No. 5, with sodium chloride, 27.60 Cc. decinormal sodium thiosulphate.

No. 6, with iodine and alcohol, 27.50 Cc. decinormal sodium thiosulphate.

After one week, another assay was made, with the following results :

No. 1, 27.60 Cc.

No. 4, 27.90 Cc.

No. 2, 27.50 Cc.

No. 5, 27.60 Cc.

No. 3, 20.10 Cc.

No. 6, 19.90 Cc.

From these figures it will be seen that the deterioration of the tincture made with iodine and alcohol alone is both prompt and marked, over 25 per cent. less iodine being observed in samples kept under both conditions of light and darkness, the difference between the two being so slight as to be negligible. It will also be noted that the sodium chloride tincture appeared to be just as stable as that made with potassium iodide, up to this time. After six weeks another assay was made, with the following results :

No. 1, 27.90 Cc.

No. 4, 28.10 Cc.

No. 2, 26.10 Cc.

No. 5, 26.20 Cc.

No. 3, 18.80 Cc.

No. 6, 17.80 Cc.

Here it will be seen that the tincture made with iodine and alcohol alone has deteriorated to a still further degree, while that made with potassium iodide shows results a little higher than before, probably due to a slight variation in the temperature of the solution and apparatus, as no temperature corrections were made in this work. The sample made with sodium chloride had also deteriorated to a slight extent, although not enough to be serious.

After fourteen weeks a final assay was made, resulting as follows :

No. 1, 27.80 Cc.

No. 4, 28.20 Cc.

No. 2, 24.10 Cc.

No. 5, 24.30 Cc.

No. 3, 16.70 Cc.

No. 6, 16.20 Cc.

These figures led to the same conclusions as those last given, the tincture made with iodine and alcohol alone having deteriorated to an extent which would bring its seller under the ban of the law in such States where the activity of the pharmacy board takes the form of investigation of conditions in the drug market.

It will be seen that the addition of potassium iodide was a wise step on the part of the U. S. P. Revision Committee, for when the product is made by the official formula there is no deterioration, when the preparation is kept either in the light or in the dark, while that made by the U. S. P. 1890 formula begins to deteriorate immediately and does not seem to be retarded by any method of keeping.

The sample made with sodium chloride did not prove quite as stable as that made with potassium iodide, although it would undoubtedly remain within the legal limit as the deterioration was comparatively slight. As the deterioration of the tincture often serves as the basis for legal action,

the absence or presence of potassium iodide may be an important factor in determining the culpability of the seller, for it would determine whether or not he had made his product according to the last edition of the Pharmacopœia.

The potassium iodide may easily be estimated by placing 500 Cc. of the tincture on a water-bath, adding several small successive portions of water, drop by drop, to aid in volatilizing the last portions of the iodine, and weighing the white crystalline residue which is left, in a tared watch-glass, which should be used for the experiment.

The conclusions reached in these experiments are that tincture of iodine made according to the U. S. P. VIII is a stable preparation under practically all conditions.

There was no discussion of this paper.

Mr. Wilbert presented a paper entitled "Seen and Heard—Some of the Shortcomings of Present-day Pharmacy," a paper showing grounds of criticism of certain retail pharmacists in the city of Philadelphia that had come under his personal observation. This paper immediately precipitated a lively discussion, led by H. B. Mason, of Detroit, and participated in by Messrs. Searby, Seaman, Hynson, Stevens, Hallberg and Wilbert, the general view being that, while the paper contained much of truth, it was inadvisable to publish it, and it was so understood and agreed. Mr. Searby suggested that, under the circumstances, the publication of the paper in the drug journals of the country would be a breach of faith and a discourtesy to the Association, and, on motion of Mr. Mason, the Secretary of the Section was instructed to communicate at once with the thirty or forty pharmaceutical journals and request them not to publish the paper. On motion of Mr. Hynson the paper was then referred to a committee of three, composed of Messrs. Wilbert, Searby and Mason, to bring this question before the Committee on Education and Legislation at the next annual meeting.

A paper on "Glycerin vs. Sugar," by Mr. William C. Kirchgessner, was read by title in the absence of the author, and referred to the Publication Committee.

The text of the paper here follows:

GLYCERIN VS. SUGAR.

What advantage has glycerin over sugar in the form of syrups and, if it has any, why not use it? That it has advantages there is no doubt in my mind, especially in the use of tannin. What per cent. of glycerin would be the best solvent? After several experiments I found the best general solvent to be a 50 per cent. solution by volume, and that it had this advantage over sugar.

Glycerin will not

Crystallize.
Ferment.
Freeze.
Caramelize.
Discolor with acids.

Sugar will.

Crystallize.
Ferment.
Freeze.
Caramelize.
Discolor with acids.

With these advantages in view, the U. S. P. syrups were experimented with, always having the finished product represent 50 per cent. glycerin by volume. They all made clear solutions at first. At the end of three months the glycerole of ferrous iodide was cloudy, and a slight precipitate had formed.

Glycerole of squill at the end of two months was cloudy. I did not ascertain what caused the cloudy appearance.

The next experiments were with the vegetable astringents of catechu, logwood and krameria, with the following results:

GLYCEROLE OF LOGWOOD.

Extract of logwood	240.0 Gm.
Aromatic sulphuric acid.....	120 Cc.
Glycerin.	2000 Cc.
Oil cinnamon.....	1 Cc.
Water, q. s.	4000 Cc.

Mix acid and water, 1500 Cc. In this dissolve the extract of logwood. Mix with glycerin and oil. Filter and decant after standing.

GLYCEROLE OF CATECHU.

Extract of catechu.	240.0 Gm.
Oil cinnamon	1 Cc.
Glycerin	2000 Cc.
Water, q. s.	4000 Cc.

Mix glycerin with 1500 Cc. water and dissolve the extract of catechu with aid of heat. Add the oil and water sufficient to make 4000 Cc. Filter.

GLYCEROLE OF KRAMERIA.

Extract of krameria.....	60.0
Glycerin	1000. Cc.
Oil of cinnamon.....	1. Cc.
Water q. s.....	2000. Cc.

Mix glycerin with 800 Cc. water. Dissolve extract in this mixture and add the oil and then water sufficient to make 2000 Cc. These preparations give good results in diarrhoea and where the drug is indicated.

ALKALOID-BEARING DRUGS.

Glycerin in itself is not a good solvent for alkaloids and glucosides. In

fact, glycerin precipitates some alkaloids. Experiments were conducted with the following menstruum: Sulphuric acid 10. Cc., glycerin 500. Cc., water 490. Cc., or using hydrochloric acid in the case of those drugs in which the hydrochloride was more soluble than the sulphate. The drug being moistened and macerated for 48 hours, hydrastis was the first drug experimented with, and it was found that in this case the menstruum would not answer, as berberine was precipitated.

In conducting these experiments I endeavored to show whether, if an acidulated solution of glycerin would dissolve the alkaloids in the drugs, the solutions would be permanent, that is, hydrolysis and precipitation be prevented. Unfortunately time has not allowed me to do this.

Mr. Scoville presented the following paper on "Quality in Dispensing."

QUALITY IN DISPENSING.

BY WILBUR I. SCOVILLE.

There's a crusade on against the nostrum. The Council on Pharmacy of the American Medical Association is leading the crusade and exposing the frauds. The Section on Pharmacology of the same Association is promoting a better understanding between the physician and the pharmacist, and is developing a better relationship. The publication and distribution of two pamphlets, "The Pharmacist and the Physician" and "The Propaganda for Reform in Proprietary Remedies," are illustrative of the work of this Section.

The new National Pure Food and Drug Law, already copied by a number of State Legislatures, has placed the Pharmacopœia and the National Formulary on a new plane, and given them a standing which years of independent effort could not do. The National Association of Retail Druggists has organized the trade and made co-operation possible in advertising as well as in other efforts throughout the country. The establishment of sectional branches of the American Pharmaceutical Association is stimulating the professional side of pharmacy, and is offering practical help along this line.

There's a new atmosphere in pharmacy and a new outlook. A change is coming, and many pharmacists are already alive to it. They are introducing specific N. F. preparations to their physicians, and asserting their ability to supply any desired type. They are seizing their opportunity, and are to be congratulated on their alertness.

Is all this the evidence of a passing fad or is there to be a real improvement in pharmaceutical life? That is for pharmacists to determine. What the future conditions of pharmacy shall be depends upon how well present opportunities are used. The opportunity is here to make a long step forward into better conditions and better relationships. It merits consideration in two ways.

Business sagacity and push is the first requisite. Thoroughness in the

details is the second. The first obtains, the second holds. If a new era is to dawn upon pharmacy, the opportunity must be held after it has been seized. It is to a point in the holding that I ask your attention.

Physicians are becoming acquainted with the Pharmacopœia and the National Formulary, and their acquaintanceship must be ripened into friendship. The introduction will accomplish but little unless a warm attachment shall follow. How is this to be secured? By keen attention to quality on the part of pharmacists. This is a vital point.

The National Formulary was designed to compete with popular proprietary articles of a semi-secret character. Now it must not be forgotten that these preparations owe their popularity, and in large measure their success, mainly to their artistic qualities. By this I mean those qualities that appeal strongly to the eye and the palate.

The fact that some of the proprietary digestive elixirs are employed by physicians, not for their claimed medicinal action but as vehicles for other medicinal agents, is significant. Elixir aromaticum, elixir adjuvans, and other official vehicles are ignored, but blank's elixir digestivum serves as a vehicle for all sorts of medicines, simply because blank's elixir is nice. The physician says in effect: "When I prescribe blank's elixir my patients give me credit for giving pleasant medicines, and it is worth the extra cost both to me and to them, and they pay for it." This sort of appeal has power in it. It is understood by everybody. The five senses are the possession of all humanity and no person or class of persons can ever get a monopoly on them. An appeal to them finds a universal response, and it needs no argument to make it bring results.

We pharmacists have been harping on "pure drugs" long enough. Nobody expects, or should get, anything impure. The day is coming when the sign "Pure Drugs" will look as foolish as would a sign "Pure Apples" or "Pure Oranges" on a fruitstand. The Food and Drug Laws will take care of the purity question, in the minds of the public at least. Pharmacists must still be particular about purity, but the time for shouting about it has gone by. Quality is another matter.

When it comes to preparations of drugs, the evidence of the senses is not to be depised. There are some things about drug preparations that physicians and patients will judge for themselves. Hence the wisdom, already well proved by a number of highly-successful preparations of making them appeal to the non-scientific mind. The manufacturers of these have not questioned the cost of material when artistic results were in view. They have realized that a formula is not a preparation, and is rarely even a complete recipe for a preparation. Every preparation may have a character of its own, independent of, yet in accordance with its formula.

It behooves pharmacists therefor to study well the artistic possibilities of their preparations, particularly in the line of flavors. This is a proper

part of professional pharmacy, not to say an essential part. And it is not a particularly difficult or obscure study.

The formulas of the Pharmacopœia and the National Formulary are an excellent basis for artistic study. Indeed the æsthetic merits of many official preparations are too little appreciated. Take, for instance, such articles as aromatic spirit of ammonia, aromatic elixir, aromatic syrup of rhubarb, compound tincture of gentian, compound tincture of lavender, and many others; these are models of art when well made. They cannot be improved upon; though they can be caricatured by the use of poor materials. I have had together a score of samples of aromatic elixir from as many different stores, all made according to the official formula, but no two alike, and some of them were travesties on the formula. No physician is to be blamed for condemning the Pharmacopœia when he meets with some of these sordid examples of pharmaceutical economy. It is rather pharmaceutical suicide.

I have wondered at times if pharmacists know that oil of lemon, for instance, of special preparation, is quoted as high as \$24 per pound, oil of orange at \$56 per pound, special brands of peppermint oil at \$9.50 per pound, lavender oil \$8 per pound, rose oil \$15 per ounce, etc. Do they ever wonder who pays such prices for oils, and what these high-priced oils are used for? It is a profitable field for reflection. One thing is certain, these expensive oils are not being used by the ignorant or the sordid.

The first thing that the pharmacist who is interested in artistic preparations needs to know is what he may avail himself of for artistic effects. Good work needs good tools. So get acquainted with the best tools. The rest is neither difficult nor mysterious.

As an illustration of the difference in effect that is obtained by a difference in quality, there is shown to you three different samples of compound spirit of lavender made with as many different grades of oil of lavender. The oil in one sample is listed at \$3.25 per pound (which is the grade commonly purchased by pharmacists), in the second the oil costs \$4.50, and the third \$8.00 per pound. Similarly two samples of spirit of peppermint made respectively with a \$2.40 and a \$9.50 oil. Is the difference in effects worth the difference in cost? Note well the effects, then consider.

First, people will pay good prices for what pleases them. This is true in all lines, and on this basis the question of cost merely determines the selling-price. And the best profits are in the best class of goods.

But in pharmacy the public has not been educated to a discrimination in quality, and may be reluctant to acknowledge that such a thing is proper. What then? Well, for one thing, advertising is necessary even in pharmacy.

Can a pharmacist get any more for an ounce of tincture of rhubarb because he sells it over a mahogany counter and in an attractive bottle? Or can he get any larger price for a glass of soda-water because he draws

it from a \$25,000 fountain? Yet he considers it good business to attract trade by appealing to the eye. He doesn't expect to get higher prices by having an attractive store, but he does expect to do more business.

The appeal to the eye is more general than is that to the palate, for the latter has to await its opportunity to make itself felt, but the latter is the more effective. It wins a confidence and respect that display cannot win, and it wins in the most profitable quarters.

Now what does this kind of advertising, considering it as such, cost?

Compound tincture of lavender made from an \$8.00 oil costs 4 cents more per pint than does that made from a \$3.25 oil. A quarter of a cent more for the best per ounce; and when it is used in Fowler's Solution the difference in cost is too small to be considered, but the difference in effects are marked. Pretty cheap advertising, if you look at it that way.

Spirit of peppermint made from a \$9.50 oil cost 65 cents more per pint than one made from the \$2.40 oil, or 4 cents more per ounce. It may be wise here to discriminate between a spirit that will go into a household for stomach-ache, and one that will be used in compound cathartic elixir, for example, or in a dentifrice. When the quantity of oil that is required to flavor a preparation is considered, the difference between the cost of the best and the cheapest is a small figure in the cost of the preparation, even though the difference in the oil prices is considerable. But the difference in results is not small. The public may not appreciate that the difference is due to quality, but it is pretty certain to see the difference.

And distinctiveness is the key to business success. There is no better advertisement for a pharmacist than the reputation of taking pride in his preparations. And there is no better incentive to professional advancement than this same pride. Pride goeth before a rise in business life.

In the writer's judgment this is an important consideration.

Physicians are ready to take up National Formulary and U. S. Pharmacopœial preparations, but they must not be disappointed in them. They have been educated to scepticism regarding the pharmacist's ability to satisfy them, but pharmacists can and must prove their ability to please. The times demand artistic as well as therapeutic results. The preparations that win must show both. Only such will hold their own. And if physicians find both results in the preparations that they shall try from their druggist, they will stick to them.

They are not likely to be satisfied with either result without the other.

The paper was received and referred for publication without discussion.

The Chairman called on Mr. Frank E. Fisk to present his two papers on "Heat and its Utility in Compounding" and "Cutting Compounding Corners, or Pharmaceutical Economics," but as the author was not present, the papers were read by title and referred for publication.

Mr. Rufus E. Smith, of Syracuse, N. Y., was then invited to present a paper he had prepared on a new device for filling and sealing cachets. The gentleman presented his subject in abstract, and invited the members to witness the operation of his machine which was on exhibition in a near-by room. The text of his paper here follows :

A NEW APPLIANCE FOR FILLING AND SEALING CACHETS.

BY RUFUS E. SMITH, SYRACUSE, N. Y.

Professor Caspari in his "Treatise on Pharmacy," page 402, says : "The use of wafers is not so much in vogue in this country as in Europe, but they are, in many respects, preferable to capsules ; less compression of the material is necessary, and the envelope, made of rice-flour is more readily disintegrated in the stomach." Professor Caspari is not alone in his appreciation of the advantages offered by the cachet as a form of medication, for the United States Dispensatory, 19th edition, page 1021, says that "for most powders of disagreeable taste cachets afford the best method of administration."

The cachet which was invented by *Limousin*, a French pharmacist, is a marked improvement on the wafer which it was intended to supersede. As pharmacists all know, the wafer is composed of a thin sheet of unleavened bread in which the medicament was folded, the wafer first being wetted. *Limousin's* invention was made public in 1873, though in King's Dispensatory the date is given as 1862. Prof. Joseph P. Remington presented at the Boston Meeting of the American Pharmaceutical Association in 1875 a detailed description of *Limousin's* apparatus, consisting of a translation of the report of a commission composed of MM. Miahle, Gobeley and Piboux to the Academy of Medicine, of Paris, which reads as follows :

"Our honorable colleague M. Bussy has placed before you a note from Mons. *Limousin* explaining a new mode of administering and preserving medicines prescribed in the form of powders.

"Practitioners who prescribe medicines in the form of powders, and, above all, patients who have to take them realize how difficult and disagreeable, sometimes almost impossible, is the administration thereof."

"Medicines in the form of pills dry out and harden, often requiring a considerable number to obtain the desired result, and the gastric juice frequently rebels at the task of dissolving them. Medicines dissolved, communicate their taste, pungent, bitter, styptic, nauseous, or otherwise intolerable, and suspended, they have those well-known inconveniences of adhering to the glass, spoon, mouth and palate, irritating the throat, often producing a cough that ejects the medicine violently through the mouth or nose.

"To obviate these difficulties, wafers have been used to envelop or wrap up the medicine in. This is not effected, however, without considerable

trouble, and then imperfectly, and at the risk of scattering or losing part of the dose. To overcome these objections M. Limousin has applied himself, and it appears to the committee, with success.

"By this method the patient receives, all ready prepared for taking, a sort of lentil-shaped seal or flattened capsule containing one dose of the powder.

"These flattened envelopes are formed by firmly cementing two concave disks together at their edge so perfectly as not to lose a particle of the substance to be administered; this is done in a moment, facilitated by the aid of a press invented by Mons. Limousin for the purpose; the concave parts thus form a doubly-convex, lentil-shaped seal or capsule, which is made of similar substance that powder wafers are made of, not so brittle, however. The smallest is the size of a nickel five-cent piece, the second the size of a silver quarter of a dollar, and the largest the size of a large copper cent. The last, and the largest size, will or can contain twenty to thirty grains of a substance of the gravity of powdered rhubarb or aloes.

"When using these wafers or capsules, it is not necessary to fold the powder in paper; they are simply put into a box in the same manner as pills, without any consperging powder, however, and with a little practice this process does not require any more time than the ordinary way of folding the powder up in paper.

"To take these capsules, you place them in a spoon with a little water; the capsule then softens, and becomes pliable without breaking, and a child can even swallow them without difficulty.

"This mode of administration recommends itself especially for bitter and nauseous medicines, such as quinine, aloes, rhubarb, ipecac, etc., but it is also of advantage for substances like bromide of potassium, and again for heavy articles like calomel, which by the ordinary way of giving powders, are left in the spoon or glass."

The report closes by stating that the chairman of the committee has seen the capsules administered and taken them himself, and he and his patients join in praising this agreeable and practical method of giving distasteful medicines.

In commenting on this report Professor Remington said:

"This report of the committee of the French Academy does not speak too highly of the conveniences of these little 'cachets' as a means of administering medicaments, and one advantage not spoken of particularly is, that they very rapidly disintegrate on reaching the stomach and thus liberate the medicines as a powder in the most simple manner. So that many prescriptions which the physician has been compelled to give in the form of a pill (on account of the nauseous nature of the powder) can now be elegantly administered by this means. The disadvantage of the pill thus being avoided, that of insolubility, and on account of the greater extent of surface possessed by the powder, the effect of the medicine is more quickly perceived by the patient.

"This apparatus promised to be the 'deliverer' which has been looked for so anxiously by many pharmacists, to relieve them from the necessity of keeping so many varieties and makes of coated pills in stock, for now the apothecary with the aid of an inexpensive apparatus, can prepare on call, either in large or small quantities, a more efficient means of pleasantly administering disagreeable substances."

Mohrstadt, of England, provides an apparatus which in some respects differs from that of Limousin, especially by being provided with an additional plate which prevents any of the powder going on the edge of the cachet. This apparatus was described in the "Chemist and Druggist," for August, 1891, page 344.

The value of the starch capsule, as it is called in Germany, and designated in the National Formulary, is quite generally appreciated by pharmacists, but the difficulty experienced in filling and sealing them rapidly and accurately has to a certain extent resulted in a disappointment of the hopes expressed by Professor Remington that they would quite generally supersede the coated pill.

I have long been interested in the cachet as a medium for exhibiting medicines, and after many years' experiment have devised what I believe is the first satisfactory machinery for automatically filling and sealing cachets. This machine I have pleasure in presenting to the notice of the members of this Section.

It will be observed that the machine is intended to act in a wholly automatic manner, the medicament being placed in a powder form in one hopper and the cachets in another; the cachets are dropped from their original container into the hopper, passing into revolving discs on either side, and following a spiral, revolving in opposite directions they are carried into shutles by which they reach the endless chain; and travel along to the first station, the moistener. From thence the chain moves to the next station, where the medicament, an accurate dose, is dropped into the cachet on one side, the cachet on the other side drops over upon it, and hermetically sealing it. The finished product drops from the chain into a receiver.

Instead of encroaching on more of your time with a detailed description of the machine, which can be best appreciated by a personal inspection, I cordially invite any interested members of this Association to call at my room in this hotel, where I shall be only too glad to operate and explain the machine.

With this apparatus it is possible to fill as many as 40 thousand cachets in a working day of eight hours, with the aid of one operator who need not be especially skilled. In fact one great advantage of this machine is that it enables the dispenser or manufacturer to dispense with a large number of skilled laborers who, even at the best, are not apt to give us as accurate doses or as perfect results as can be obtained with the ma-

chine which I have pleasure in submitting for the study of the members of the Association.

Mr. Hallberg was inclined to object to the introduction of such papers before the Section, because it was "medication in dosage."

The paper was received and referred to take the usual course.

The next paper was entitled "The Modern Pharmacy," by Mr. Bernard Sachs, and the author presented his subject as follows :

THE MODERN PHARMACY.

BY BERNARD SACKS, NEW YORK, N. Y.

If old Rip Van-Winkle were to get up and look for a drugshop in order to obtain some refreshing cordial after his long slumber he would experience great difficulty in locating one, for he would surely pass by our drug stores without recognizing them as such, but he may mistake them for dry-goods stores on account of the display of towels and bathing suits in the great show-windows ; he may take them for cigar stores on account of the gorgeous display of cigars and cigarettes, or he may think them to be stationery stores if the display were to consist of writing paper or pyramids of rolls of toilet paper. Hoping to locate the drug store by his sense of smell, by the fine penetrating odor of volatile substances, by which a drug store could be felt for quite a distance, he would even then be disappointed, since the fragrance of the drugs is in the pharmacy of to-day entirely replaced by the disagreeable smell of sour milk, exhaled by the monstrous soda fountain. Nor would Washington Irving's hero find it any easier to recognize the modern drug store by its interior, since through its so-called progressive steps it does not any more represent, simply, the pharmacist's laboratory, the place where he preserves his drugs, prepares his mixtures and exposes them to the public. It has been enriched by various side-line additions ; it has been gradually converted into a combination drug, cigar, candy, confectionery, liquor store ; a first-class ice cream parlor ; it carries a line of dry goods, hardware, groceries and what not. In some instances these *side-chains* seem to predominate so much over the nucleus of Pharmacy—they tend to overshadow and crowd the poor little nucleus so much—that the latter seems to undergo pressure atrophy.

Especially is this phenomenon noticeable in drug stores, where the premises are small. The soda fountain, of course, takes up the most prominent position. All available space is occupied by a number of show cases filled with cigars, stationery and chocolates, while the tincture bottles are relegated to the back of the store, where they are apportioned a few feet of shelving and kept there in negligence either as an excuse or as an apology. The only drugs that are given any consideration are the nicely wrapped-up ready-made preparations, mostly the well-advertised patent medicines sold

at cut-rate prices. In vain would he look for a bundle of sarsaparilla root, or cinchona bark, or a demijohn of acid. The herbs, if any are kept, are put up in compressed packages, so that they never see the shine of daylight. In his everyday routine work how often does a modern pharmacist come in contact with the crude materia medica? When behind the sales-counter he is simply an automatic machine, handing over certain ready-made articles to his customers, the only knowledge required for which work is to be informed of the condition of the market. When behind the prescription counter at least four times out of ten he measures and weighs the ingredients of the prescription out of some kind of a container that holds a proprietary medicine. He exercises a knowledge in pharmaceutical chemistry only so far that he puts up his solution of citrate of magnesia, which for obvious reasons cannot be gotten ready-made; or once in a while prepares spiritus mindereri. If he is sometimes called upon to fill some capsules, or to make some suppositories, he does so, yet without deriving any great pleasure from his work. It has become a custom to prepare the tincture (and even infusions) from fluidextracts. The fluidextracts, the calomel tablets and other preparations are obligingly furnished by the manufacturing house. The preparations that are displayed on the shelves under his own name are no longer prepared by the pharmacist himself. A great number of "non-secret" manufacturing chemists came into existence, who relieve the pharmacist of his tedious work. Incidentally, the manufacturers relieve the pharmacist of the greater part of his profits.

In some way or other a demand was created for ready-made preparations, in nice, neat packages, with a euphonious name. This is called "elegant pharmacy." But the customers seem to have caught up with the time: they not only want elegant packages, but they want them of a certain kind only (usually not the kind that you prepare or that was prepared for you) they want "Wood's" sarsaparilla, "Greene's" hair tonic, "Dr. Puck's" toothache drops, "Dagger's" cold cream, and "Cheat's" quinine pills. You cannot refuse them or offer them your own, just as good stuff; the customer will surely call you substituter, and you must care a good deal for the opinion of that customer in order not to injure your soda trade. Oh, that soda fountain! How seldom it represents a fountain of joy to the pharmacist, and yet the most valuable place is given to this idol of stone, and the pharmacist is rarely, if ever, getting any returns for the affection and services lavished.

Still and all, some of the largest up-to-date stores have at least a reputation of being profitable business propositions. For the loss sustained in their professional character they become money-winners to their owners. But scattered all over the city we find drug-stores of a different type, and of such the great majority conducted with very little business ability, and of even less professional efficiency.

Since all drugs and preparations are obtainable ready-made, no extra

skill or experience are necessary; since goods are obtained from the jobber in least possible quantities, no great capital is necessary to start up a drug-store like that. They are constantly engaged in degenerating competition with the neighboring stores; inadequate stock fosters substitution; insufficient income precludes the possibility of employing decent help. Where the population is ignorant or vicious, certain drugs are openly sold without restraint and principle. Between these two extremes I see a grand old pharmacy, far away across the ocean, whereto I used to run when a boy for our family necessities. A sombre place and quiet; fragrant and awe-inspiring; rows of bottles and jars filled with herbs and chemicals, surgical dressings, etc.

No penny-in-the-slot machine, no souvenir postal cards, no hair insoles and no peanuts. When I recollect the spacious laboratory on the ground floor filled with apparatus and men busy all the time making their pharmaceutical preparations, and compare it with the "laboratories" that I see here now, I cannot help thinking that the so-called progressive development of pharmacy is simply a process of degeneration depriving the drug store of to-day of its true character, which was mainly brought about *firstly*, by the ever-increasing number of patent medicine firms which prey upon the pharmacist, depriving him of his vocation and of his profits, and *secondly*, the multiplication of the non-secret manufacturing firms which relieve the pharmacist of most of his work, cutting down the number of help necessary to conduct a pharmacy.

These two conditions combined brought about the *third*, namely, the rapid multiplication of small drug stores, run by the very men who were excluded from work in the large pharmacy because their work was appropriated by the manufacturer. Some of those small proprietors would gladly prefer a steady position with a salary that would insure them a decent livelihood instead of uncertain slavery of proprietorship of a miserable store. It would certainly be advantageous for the proprietors to keep their clerks instead of allowing them to start in business for themselves, thus creating competition from which every one suffers. To successfully combat these degenerating, evil influences should be the watchword of the pharmacist, individually and in organization. Let the pharmacist give his undivided attention to his professional work, let him make his own preparations, let him engage in pharmacy proper and he will become enabled to set himself free from the necessity of being a dealer in all kinds of goods and thus gradually recover for the drug store its natural position, that highly dignified position it occupies in European countries, where it is remunerative and honorable.

Mr. Hallberg said there was a great deal of truth in what the writer said, and he derided the modern pharmacy with its handsome onyx, nickel-plated front and its cubby-hole of a laboratory in the rear.

Mr. Boring said the condition complained of could never be otherwise in a republic ; it might be remedied in a monarchy, but he did not think it could in America.

Mr. William F. Kaemmerer presented the following paper on the cleaning of graduates, mortars, etc. :

WHO SHALL CLEAN THEM?

BY WM. F. KAEMMERER.

The above title, of course, has reference to graduates, mortars and other utensils that have been used during the day in the compounding of prescriptions and the question I would discuss is : Is it better for each dispenser to clean these utensils as he uses them or shall he allow them to accumulate for someone else to clean ?

Having had the experience of working under both systems, I am free to say that I prefer the former method and will state my reasons for such preference.

There is no question but that the matter of individual training has much to do with the situation. I have always believed and was taught that to leave graduates and mortars used by me for someone else to clean was only a lazy man's method of doing work. To leave these utensils for someone else to clean is agreeable I will admit, but the method has its disadvantages. It is claimed that it is economy to have this kind of work done by cheap help. I am opposed to this view and contend that the opposite is true. I believe that I am not exaggerating when I say that the man who knows that he need not clean his own utensils will use at least three times as many graduates and mortars as he would do if he knew that he had to clean them himself. In this greater use breakage is also to be considered and when graduates and mortars are allowed to accumulate the element of risk is proportionately greater and the loss from this source will be a considerable item, possibly ten times as much as it would be otherwise. Where every dispenser is required to clean his own graduates and mortars rarely are any of them broken. If they are left for the boy or porter to clean, the sound of broken glass will be a daily occurrence.

Convenience is also to be considered. Few retail stores have an unlimited supply of glassware. It has been my experience that the average proprietor is never in a hurry to replace broken ware and, as a consequence, the dispenser has not always at hand the particular graduate or mortar he ought to or would like to use, the article he should have being either dirty or broken. He will often use a four or six ounce graduate when he should use an ounce graduate. I have even observed some dispensers attempt the dangerous feat of measuring a drachm of tincture of digitalis or tincture of aconite in a four-ounce graduate because all of the smaller graduates were dirty and they were too lazy to clean the utensils they needed.

Some stores do not have such a thing as a minim graduate, the proprietor, not always a druggist, having become tired of replacing those which have been broken. Besides this, where is there a dispenser who has not his favorite mortars, those he would like to use above all others and those he is used to handling?

Many stores, too, are short on spatulas. Those of the kind you ought or would like to use are often dirty and then, what is more aggravating than to find a spatula that has been lying in the sink over night? Is there anything that will quicker ruin a spatula?

The boy or porter is not always particular, or not knowing what has been in a graduate or mortar, he cannot know how best to clean them. It will thus take him three or four times as long as it would take the man who had used them, for knowing what had been used in them he would know just how to clean them.

The boy will often allow oil or iodoform to come in contact with nearly everything and in his cleaning operations will unnecessarily use large quantities of acids, ammonia and alcohol. He does not know what to use and when to use it; he tries first one thing and then another.

I have never yet seen a boy or porter who could clean the utensils I have used as well as I can clean them myself. I am rather particular. Where dirty utensils are left to accumulate they seem harder to clean than if they had been taken care of immediately after use. There will also be a lot of mortars on hand with broken lips and graduates that will not stand alone, with the additional annoyance of having the wrong pestle in the mortar.

The clerk who leaves graduates and mortars for some one else to clean tends to become careless in his work and other things that he should do he will leave for some one else to take care of.

Observe him carefully and you will find that he is the "Johnnie" who forgets to put things on the want book, forgets to make charges and credits. He will be guilty of numerous bad practices which are so annoying to the busy pharmacist, such as: selling the last ounce of alcohol or ammonia without refilling the shelf-bottle or telling someone that it was empty; putting goods away without untying them so when you get a call for five cents' worth of flake white you will have to stop and undo a five-pound package; filling tincture bottles without first cleaning them or removing the sediment that may have formed in them. It is difficult for him to put things back in their proper places after having used them.

A practical illustration will show the difference between the two systems. Let us take the following ten prescriptions, the compounding of which represent just a pleasant evening's work for one man:

Potassium citrate	2 drachms.
Spirit of nitre	$\frac{1}{2}$ fl. oz.
Infusion of digitalis, sufficient to make.....	8 fl. ozs.

This would call for an ounce and an eight-ounce graduate, stirring rod, funnel, infusion jar, a vessel in which to heat the water, and a flat-bottom brass mortar.

As there is nothing greasy or oily in the prescription, all utensils employed in its preparation can be easily and quickly cleaned. Our brass mortar is both ornamental and useful, consequently we always keep it highly polished. In this case I would use the mortar to bruise the digitalis leaves. It can be easily and quickly cleaned by rinsing in clean water and after draining, quickly dried with a clean towel. If left till morning without cleaning it would probably become spattered with acids or soap suds and thus be four times as hard to clean and polish. In the same way all of the other utensils can be quickly cleaned.

Mortars and graduates before drying with a towel should be turned bottom up and allowed to drain on another towel. In this way the dispenser can almost always have a clean dry towel. Give some a dozen clean towels and before the day is over they will have every towel dirty. They will wipe up syrup, glycerin or oil with the first cloth they can lay their hands on, and that is almost always a clean, fresh towel. They will then use the same towel to wipe off other things, and in less time than it takes to tell of it they have (figuratively speaking) syrup and oil over all creation. A clean towel should only be used for drying or wiping things that are clean.

One who understands the art of cleaning will rarely use over two towels a day even in a busy prescription department. For cleaning the inside of the neck of a funnel I use a twisted piece of soft paper, working it back and forth. An infusion jar should always be cleaned and put away immediately after use. If left until morning it will almost surely be broken. Glass stirring rods too should be cleaned and put away immediately after use.

The next prescription is one for suppositories :

Powdered opium.....	18 grains.
Extract of belladonna.....	3 grains.
Iodoform	1 drachm.
Cacao butter, sufficient to make 12 suppositories.	

As we make nearly all our suppositories by fusion, we should require here a suppository mould, a mortar and pestle, and a spatula.

Our suppository mould is of brass and like the brass mortar is always kept highly polished. After use it should be quickly cleaned by first holding it over a flame to soften any adhering cacao butter, then rubbing it in clean sawdust, washing with plenty of soap and water, and after draining, drying it with a clean towel.

Pursue the same course with the mortar and pestle and the spatula ; only in the case of the former remove the last traces of iodoform before

drying with a towel. This can best be done by crushing about a drachm of hyposulphite of soda in the mortar, filling it with water, and then adding a small quantity of hydrochloric acid. After standing a half hour rinse with plenty of clean water. This method also serves to remove the last traces of asafetida. We do not keep individual mortars for iodoform mixtures, asafetida mixtures nor for ointments. Any mortar or graduate we have may be used for any proper purpose at any time.

The third prescription is for a lotion :

Solution of subacetate of lead	1 fl. drachm.
Tincture of opium	1 fl. drachm.
Water, sufficient to make	8 fl. ounces.

Here I would use only an ounce-graduate, which I would clean immediately with water and a brush. If the graduate be left to dry without cleaning there would be trouble if any one did not know just what had been measured in it.

The next prescription :

Potassium iodide	6 drachms.
Bichloride of mercury	1 grain.
Compound syrup of sarsaparilla	2 fl. ounces.
Water, sufficient quantity to make	8 fl. ounces.

Here I would make use of a test-tube, dissolving in it by the heat the bichloride of mercury in two fluid drachms of water by the aid of a small quantity of potassium iodide. I would immediately after use rinse the test-tube in clear water and drain. If the test-tube be left for the boy or porter to clean it will surely be broken.

The fifth prescription is for an eye water :

Boric acid,	
Sodium bichlorate, of each	20 grains.
Camphor water.	$\frac{1}{2}$ fl. ounce.
Distilled water.	$1\frac{1}{2}$ fl. ounces.

Here a small chemical funnel will be required. The same remarks that apply to the test-tubes will apply also to glass funnels large and small.

The sixth prescription :

Potassium acetate	3 drachms.
Tincture of digitalis	1 fl. drachm.
Fluid extract of couch grass	1 fl. ounce.
Deodorized tincture of opium	1 fl. drachm.
Aromatic elixir, sufficient to make	4 fl. ounces.

I would use a minim graduate for measuring the two tinctures. Graduates of this size are very easily broken if not cleaned and put away immediately after use.

It is characteristic of the man who doesn't have to clean his own graduates to be careless of the amount of work he makes for others. He will weigh out potassium acetate or other chemicals and not be particular of how much he spills on the scale pan or weights. He does the same thing when he weighs chemicals on the counter scale. He don't seem to care how much he spills. This is very discouraging to one who is trying to keep things neat and clean. Of course, every well-regulated prescription department has a stock solution of potassium acetate. I merely make use of the salt here as an illustration.

The seventh prescription calls for an ointment :

Salicylic acid,	
Resorin, of each	15 grains.
Ichthylol.....	1 drachm.
Lanolin.....	7 drachms.
Petrolatum.....	6 drachms.
Oxide of zinc.....	6 drachms.
Starch	7 drachms.

This was mixed in a mortar which was afterwards cleaned by rubbing with sawdust and then using plenty of soap and water. Sawdust once used for cleaning mortars that have been used for iodoform or other odoriferous substances should be thrown away.

The eighth prescription.

Ferrocyanide of iron	
Sulphate of quinine, of each	30 grains.
Piperine	3 grains.
Extract of dandelion, enough to make	15 pills.

The prescriber could not have selected a more appropriate excipient here than extract of dandelion. It works to perfection. The dispenser, if he is careful, will only slightly stain the tips of his fingers and but little of the blue color will adhere to the pill machine. The interesting part is that of cleaning the mortar. It is very easy if you know how ; if you don't know how, the mortar will be only half cleaned. For removing the ferrocyanide of iron a little liquor potassæ or potassium carbonate works like a charm. After you have got rid of the blue color you may think that your mortar is perfectly clean, but not so. You still have some piperine to contend with. Place a small quantity of concentrated sulphuric acid in the mortar and notice the red color which is produced. The porter would never think of going to this trouble. All mortars look alike to him. The brass cutting parts of the pill machine should also be polished and in the same way as you have done the brass mortar and suppository mould.

The ninth prescription :

Oil of turpentine	
Olive oil	
Oil of origanum, of each,	1 fl. ounce.

In cleaning graduates in which oil has been measured, use first sawdust and then plenty of soap and water.

The tenth prescription :

Codliver oil.	125 Cc.
Acacia, in fine powder,	31.25 Gm.
Syrup.....	25 Cc.
Oil as Gaulthiria.....	1 Cc.
Water, sufficient to make.....	250 Cc.

This is the official codliver oil emulsion. Soap and water is all that will be necessary to clean the mortar and the oily graduate may be cleaned as described under the previous prescription.

It has taken me longer to describe these various cleansing operations than it would to do the actual work. Let us see where the difference comes in. Which would you prefer? In one instance everything would be cleaned and put back in its proper place. The prescription department would look ready for business and the following morning you could fill the first early prescription without any annoyances. Everything would be clean and in its proper place as you should expect.

On the other hand no self-respecting porter works in a drug store after six p. m., and in these days of shoe factories no boy works in a drug store after seven p. m. ; consequently if left for others to clean all of these graduates and mortars would have to lay over till the morning. The next morning the boy will have some very important deliveries to make, the porter has his other cleaning to do, the soda fountain has to be iced, and the work drags along till ten a. m., and the mortars and the graduates are not yet cleaned. In the meantime, prescriptions come piling in.

There is a certain mortar you want to use. It is dirty and no other will do quite so well. You must stop and clean it. You would have better cleaned it in the evening before and done with it. But in not doing it you must stop in the midst of a bunch of prescription work and clean a mortar ; you get rattled and break a graduate or two in the bargain.

I do not want anybody to think that the reason I prefer to clean things as I go along with my work is because we have only two graduates, one mortar and one funnel. As a matter of fact we do have a plentiful supply of all of them, a much better supply than can be found in some of the more pretentious stores. Nor would I have you think that I would stop in the midst of a rush of prescriptions and clean an iodoform mortar, or polish a suppository mould, or clean an oily graduate. These I would set aside till the rush was over. But clean them I would before I went off duty, and I would not work much overtime at that. I would merely stop long enough to rinse a graduate or mortar which had contained something readily soluble in water, turn it bottom up and allow it to drain and afterwards dry with a clean towel.

There was no discussion on the paper and it was received and referred.

Mr. Hallberg presented in abstract the following paper on "Tablet Chemicals":

TABLET CHEMICALS.

BY C. S. N. HALLBERG, PH. G., M. D.

The custom introduced some ten years ago of preparing alkaloids and their salts in the form of tablets for dispensing purposes, while still adhered to is, it is believed, largely on the decrease.

Several fatalities resulting from the ignorant use of some of these potent tablets as the dispensing of $\frac{1}{2}$ grain strychnine tablets, instead of $\frac{1}{8}$ grain, for one dose at a Chicago hospital some years ago, has caused the disappearance of the dispensary tablet in certain quarters, but they yet remain a menace to life and their manufacture should if possible be prohibited. But it is not the powerful alkaloids and their salts alone that are presented in this form, but also many other chemicals and the use of many of these is attended with just as much danger as are the alkaloids.

A few years ago the country was startled by the announcement of the death by accidental poisoning of a celebrated chemist in Philadelphia who swallowed a dispensary tablet of mercuric chloride for preparing extemporaneous solution, by mistake for one of sodium bicarbonate. Similar occurrences are frequently reported in the press although with meagre details, sufficient, however, to prove that these tablets are still doing their silent deadly work. When accessible to the laity or even to doctors who dispense and the average hospital or dispensary, they form a menace which becomes startling when it is considered that the mistake can be so easily covered up as to defy detection.

A tablet means a *dosage-form of medicine for internal use* and should not represent more than the average adult dose, in fact considerably less, since they are in the exact category of other dosage-forms, such as, powders, capsules, cachets, pills and troches. These always represent lesser doses so that the dosage may be graded, and a full dose usually requires several of these respective forms.

It is maintained that no medicinal agent can be prepared in tablet or other dosage-form in such amount as to be fatal to adult human life, without making the manufacturer liable for such damages as may result from the ignorant use of such tablet.

Recently the omnipresent tablet has been taken advantage of by a certain class of manufacturers as a form in which to introduce new preparations, or even new chemicals. While the custom is not as yet extensive, it is desired at this time to utter a warning against such practice. It is admitted that there are certain substances which from their physical character may have to be presented in some ready-dosage form. Some articles like ferments and other biologic products may not admit of being pre-

sented in pure or definite form without being prepared in dosage-form. Others are exceedingly hygroscopic, and must be prepared in some special form in order that their properties may be preserved. This is the case with the suprarenal principles which are presented by the manufacturers in all the pharmaceutical preparations: solutions, sprays, ointments, suppositories, etc.

While such procedure may be necessary with agents of this kind it should be strictly confined thereto. As pharmacists it is our prerogative to prepare and compound the pharmaceutical preparations—at least all of the classes for which working formulas appear in the U. S. P. and N. F. It is enough that these new remedies as a rule cannot be made by us but must be bought; if the preparation of the pharmaceutical forms employed by physicians is denied us, then surely there will be nothing left of our pharmaceutic art and practice. Recently the agents of a well-known German house have introduced a series of tablet combinations of the Glycerophosphates and bestowed on them coined trade-names. This illustrates one method which is destructive to pharmacy and honest medicine and designed to play into the hands of the self-medicating public.

The most serious phase is, however, that substances in tablet form cannot be examined as to their identity, purity or strength, since they as a rule are mixed with other substances to give them form and thus their characteristics are either impaired or modified. The pharmacist is thus placed at the mercy of the manufacturer besides being denied the privilege of practising his art. Fortunately but few articles appear as yet in this tablet form, but it is time to warn manufacturers that the attempt to introduce a chemical solely in tablet form is considered unethical and unjust to pharmacists.

The paper was received and referred without discussion.

Mr. Louis Schulze, of Baltimore, presented the following paper:

PRACTICAL THOUGHTS AND SUGGESTIONS.

BY LOUIS SCHULZE.

It is a trite maxim that "there is nothing new under the sun." Nevertheless we can all learn something from the experience of others, and having mentioned the sun reminds us that that body is the center of a fixed and definite system; and system is the first subject we wish to dwell upon in this paper, for having recently purchased a store where chaos reigned supreme we were forcibly reminded of the great necessity of systematically arranging the stock of a pharmacy.

Our method has been to divide the store as well as the stock room into sections, each of which is known by a letter of the alphabet in its consecutive order and then consecutively numbering the shelves in each section, then placing articles of a similar nature so far as possible together,

as for example, all solutions in one section, tinctures in another, syrups in another, etc. We then make an alphabetically arranged index of the entire stock and when any article is called for the location of which through infrequency of sale is not at once recalled, this index at once reveals its place, thereby saving time and often the loss of a sale.

In making acid solution of phosphates N. F., we find difficulty in securing bone ash, as the jobbers invariably send us animal charcoal; we have also had trouble in securing a good light-colored article of kaolin for making cataplasm of kaolin, U. S. P., hence it seems the jobber should be better posted on the requirements of the new U. S. P. and N. F. It has been our experience that physicians look for a red liquid when prescribing an elixir of any of the bromides, hence it would be well to add compound tincture of cudbear to these in future revisions of the N. F. The N. F. under Villate's Solution, page 104, directs "Set the mixture aside, so that the precipitate may subside. Then decant, or siphon off, the clear liquid and preserve it for use;" this we found to be contrary to desires of veterinarians in our locality as they desire the precipitate to be dispensed in the prescription and a shake label attached to the bottle; as they claim they intend the precipitated lead sulphate to act as a covering to the applied surface.

In our vicinity we find physicians prefer a yellow antiseptic powder, and believe it would be well to add powdered hydrastis to the soluble antiseptic powder of the N. F., should this meet with general approval.

Mr. Raubenheimer presented the following paper on the subject of "A Continuous and Automatic Lime-water Apparatus":

A CONTINUOUS AND AUTOMATIC LIME WATER APPARATUS.

BY OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

In the preparation of lime water, a lump of lime, a pail of hydrant water and a stick of wood are only too often the materials and utensils employed by the average druggist. If we consider the fact that lime water is used (1) in vomiting and other affections of the gastrointestinal tract of infants as well as that of adults; (2) largely in food for babies for the correction of acidity of the stomach and also to help develop bones and teeth; (3) in the modification of cow's milk to render it alkaline and nearer to the composition of mother's milk and also to increase the percentage of calcium; (4) in the official preparation of linimentum calcis or carron oil, and (5) in such N. F. preparations as black and yellow wash, then should it not be the pharmacist's duty to pay a little more attention to the preparation of lime water, so as to produce a reliable and full strength preparation? It is true the Pharmacopœia gives explicit directions for preparing liquor calcis, which should be a saturated solution of calcium hydroxide in *distilled water*. The official *modus operandi* can be divided into five steps as follows:

(1) The calcium oxide should be slaked into calcium hydroxide by means of *distilled water*; (2) the calcium hydroxide should be washed with distilled water to remove the soluble impurities; (3) the coarse and heavy sediment should be rejected, thereby removing the insoluble impurities; (4) only the liquid holding the finer particles of $\text{Ca}(\text{OH})_2$, in suspension, that is the thin milk of lime should be poured off into the lime water bottle; (5) after the finer particles subside the clear liquid is dispensed as lime water, by pouring it off and not by filtering it, as the filter paper has a great affinity for $\text{Ca}(\text{OH})_2$, and the filtered lime water will contain less $\text{Ca}(\text{OH})_2$, than the U. S. P. decanted lime water.

If the foregoing five steps are followed the product will represent the official lime water.

The calcium oxide should of course be in white, hard pieces, recently calcined. The purest form of lime is that obtained from the calcination of white marble. Although the price is a little higher than that of ordinary varieties remember that one pound will furnish about 500 pints of full-strength lime water. Lime which is discolored contains iron; and lime which is brittle and crumbles easily has become air-slaked by the absorption of CO_2 . Such lime should not be used in the preparation of lime water.

Now a few words about the water. The U. S. P. distinctly prescribes the use of distilled water. The ordinary or hydrant water should not therefore be employed. Most of the distilled water which is used for drinking purposes is aerated to make it more palatable than the so called "still" or "dead" distilled water. But if distilled water is aerated it also absorbs CO_2 , which is objectionable. Therefore non-aerated H_2O , or recently distilled water only should be used in the preparation of liquor calcis.

But unfortunately for two reasons lime water is not very stable. 1. As soon as any air enters the lime water bottle CO_2 is absorbed, and a pellicle of calcium carbonate is formed on the surface of the water and on the sides of the bottle. 2. When the temperature of the room rises some of the calcium hydroxide is precipitated, as it is more soluble in cold water.

These two points, together with the fact that the preparation of lime water should not be neglected and (I am sorry to say the preparation of lime water is sadly neglected in most drug-stores), caused me to experiment on this subject.

It was my intention to present the results of my experiments in a paper before the Atlantic City meeting of this Association in 1905, but sickness prevented my attendance. I consequently have had two more years' experience and I can fully assure you that the lime water apparatus works perfectly.

Five years ago, in the summer of 1902, I constructed my first apparatus. A large Woulff bottle with two necks serves as the lime water container, this being filled with thin milk of lime as prepared and described under

steps 1, 2, 3 and 4. Both necks are fitted with one-hole rubber stoppers and glass tubing. One of the glass tubes is bent so as to act as a syphon. Its short end in the Woulff bottle reaches a little above the layer of Ca(OH)_2 , and the long end outside has a piece of rubber tubing and also a pinchcock attached which serves as the outlet for the lime water. One end of the glass tube in the other neck of the Woulff bottle reaches just inside of the rubber stopper and this admits air to the apparatus. Now in order to keep the CO_2 away from the lime water, I wash this air by passing it through a solution of a fixed alkali, KOH or NaOH (the volatile alkali ammonia of course will not do), which absorbs the CO_2 , thereby admitting only air minus CO_2 into the lime water apparatus.

As soon as the syphon is started then the apparatus will be in working order. When I need lime water I hold the bottle to the outlet, open the pinchcock and the clear and saturated solution of Ca(OH)_2 in distilled water runs out. At the same time air bubbles through the alkali solution in the wash bottle and, there deprived of its CO_2 , enters the apparatus and does not cause a pellicle of CaCO_3 to form on the surface of the lime water. An indicator, as for instance T. S. phenacetolin, added to the alkali solution in the wash bottle and turning a yellowish color will tell you when the alkali is used up. A pink color indicates formation of carbonate, and an intense pink color, of bicarbonate, and then of course a little more free alkali has to be added into the wash bottle so as to absorb the CO_2 from the air passing through the solution.

In the course of time this apparatus proved to be too small. It is an ideal apparatus for the laboratory or store where only small quantities of lime water are needed. As a very large, about 5-gallon, Woulff bottle would have to be manufactured to order, and would be quite expensive, I finally, in the spring of 1905, constructed the following lime water apparatus.

A strong 5-gallon green glass bottle—green glass is affected less by alkali than flint glass—is completely filled with the thin milk of lime, as prepared and described before. This bottle is placed directly on the floor of the cellar. The neck of this lime water bottle is filled with a two-hole stopper, through which pass two strong glass tubes. The entry tube reaches almost to the bottom of the bottle and the other, the lime water delivery tube, starts in the upper part of the apparatus. Both glass tubes pass through a hole in the floor up to the counter in the store above. The entry tube is connected with a vessel containing distilled water. The delivery tube is bent around, its end being filled with a piece of rubber tubing and a pinchcock, in such a manner that the customer's bottle on the counter can be easily and readily filled with lime water by opening the pinchcock. The vessel containing the distilled water, for instance a percolator with a cover or a large bottle, must be placed in such a way that the level of the distilled water is always above the lime water outlet.

Never allow the water in this vessel to run out entirely, but always keep it filled, otherwise air containing CO_2 will enter the apparatus. You can easily see that by opening the pinchcock at the outlet, the *clear and cold saturated* lime water will run out. During hot weather, for instance, I can dispense lime water at a temperature of from 55 to 60 degrees F. At the same time distilled water will run down the glass tube and will be cooled on its way into the apparatus, with such a force as to stir up the $\text{Ca}(\text{OH})_2$ at the bottom, thus forming a cold and saturated solution. It will therefore be unnecessary to shake the 5-gallon bottle. During cold weather the apparatus has, of course, to be protected against freezing.

I test the lime water frequently with $\frac{N}{10}$ V. S. oxalic acid, using phenolphthalein as indicator. I find the percentage of $\text{Ca}(\text{OH})_2$ to vary between 0.165 and 0.175. The U. S. P. minimum limit is 0.14 percent.

I sell my lime water at ten cents a pint or fifteen cents a pint bottle. The following is my label :

<p style="text-align: center;">LIME WATER.</p> <p style="text-align: center;">A Saturated Solution of Calcium Hydroxide $\text{Ca}(\text{OH})_2$ in Distilled Water.</p> <p style="text-align: center;">Prepared, kept and dispensed in a hygienic and sanitary method according to my own process.</p> <hr/> <p style="text-align: center;">KEEP THE BOTTLE WELL CORKED AND IN A COOL PLACE.</p> <hr/> <p style="text-align: center;">OTTO RAUBENHEIMER, PH. G., The Family Chemist, 1341 Fulton Street, cor. Verona Pl., Brooklyn, N. Y.</p>
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The advantages of my lime water apparatus may be enumerated as follows :

(1) It is continuous ; (2) it is automatic ; (3) it supplies a cold saturated solution of calcium hydroxide ; (4) it gives an abundant supply of clean lime water, as no CO_2 can enter the apparatus ; (5) the lime water is prepared, kept and dispensed in a hygienic and sanitary method ; (6) last but not least the apparatus is out of your way and out of sight.

CONCLUSIONS AND SUGGESTIONS.

Brother and sister pharmacists, pay a little more attention to the preparation of lime water, which should be a saturated solution of calcium hydroxide in *distilled water*. Do not sell inferior lime water, or worse yet, do not give away so-called lime water. I am sorry to say such signs as "No charge for lime water" or even, "Help yourself to lime water, any quantity free," are often met with in so-called drug-stores. But do pre-

pare and sell a reliable and full-strength lime water. You can easily construct as I have done and as I have fully described to you, a continuous and automatic lime water apparatus.

Mr. Hynson said it was such papers as this that he liked to see presented in this Section. They were thoroughly practical and helpful, and combined practical with good, scientific knowledge. He hoped the author would follow the Association around the country and read a paper like this every year.

The Chairman said that he was sure Mr. Hynson's remarks were appropriate and fitting, and that all agreed with him.

A paper by Mr. H. C. Blair on "Elixir of Curaçao" was read by title and referred.

The Chairman called for new business, but none was offered.

The Chair said the time had now come for the installation of officers of the Section, and appointed Mr. Hynson and Mr. Hallberg a Committee to escort the new officers forward for installation. These gentlemen conducted Mr. Apple, the new Chairman, to the rostrum and introduced him. Mr. Dunning said he was glad to turn the office over to so capable a man, and said Mr. Apple had been of great assistance to him during the past year as Associate on the Committee. Mr. Apple thanked the Chairman for his kind words, and said he would endeavor to conduct the office in a proper way, and give every man "a square deal." He reminded his associates on the Committee that they would be expected to render active assistance in the work, and asked that they respond promptly to all appeals made to them. He thanked the members and expressed his appreciation of the honor conferred.

Mr. Apple then took the Chair.

Mr. Hallberg presented the new Secretary, Mr. Weinstein, who was to succeed himself in that office. The Chairman said that Mr. Weinstein's record during the past year was sufficient evidence of what the value of his work would be during the coming year. Mr. Weinstein said he had not accomplished very much, but had tried to do something. He was sure the new Chairman would give him plenty of work to do, and he would try to do his duty. He thanked the members for the honor bestowed upon him.

The new Associates on the Committee, Messrs. E. Fullerton Cook and Wilbur L. Scoville, had taken their departure and could not be installed.

On motion of Mr. Wilbert, seconded by Mr. Diner, the Section extended its thanks to the retiring chairman, Mr. Dunning, for the elaborate program submitted, and the efficient manner in which he had presided over and conducted the sessions of the Section.

On motion of Mr. Patton, the Section then adjourned.

Papers read by title :

CATAPLASMA KAOLINI.

BY HENRY C. BLAIR.

It is not generally known that this preparation of clay and glycerin is an old one, but such is the fact.

In the year 1858 Mr. James T. W. Smith proposed as a substitute for the old glycerin and starch plasma a mixture of (fuller's) earth and glycerin. This, of course, was the same as cataplasma kaolini in its effect, etc.

An ordinary flaxseed poultice seems to be just as efficacious as either the starch or glycerin, fuller's earth and glycerin, or the many proprietary cataplasms.

However, at this time both physicians and pharmacists are coming to a realization of the fact that ethical pharmacy and medicine are absolutely necessary if we are to save our profession from ruin, and the public from injury through quackery. Therefore, the formula for this clay and glycerin poultice had been introduced into the United States Pharmacopœia under the name "Cataplasma Kaolini," and is intended to replace the various proprietary and secret articles of the same kind.

Many questions have arisen in regard to the manufacture of this preparation. All of these can be easily answered by any one who has made cataplasma kaolini a few times, and carefully followed the directions of the U. S. P.

Some clays are better than others in texture and color; that is, they make a better preparation in color and appearance, and it might be well for the U. S. P. to order clay of a definite texture and of as light a color as possible to be used.

No matter how much care is used in selecting and combining the ingredients, some glycerin will separate on standing.

If the clay is not thoroughly dried before the glycerin is added, the result will be unsatisfactory. Either the glycerin will separate to a considerable extent, or the mixture will swell when put in cans.

Any pharmacist should be able, by following the U. S. P. formula carefully, to make cataplasma kaolini that will be superior to many, and equal to the best proprietary article of the same kind now on the market.

The claims of superiority and secrets of making by proprietary houses are absurd, and while they may mislead some physicians who have no knowledge of practical pharmacy, they should not be taken seriously by pharmacists.

Cataplasma kaolini made in a power mixer is superior to that made by hand, unless the quantity is small, as the former is generally more homogeneous. However, one kilogram may be made in a large mortar as successfully as in a power mixer.

The careful drying of the clay, and the thorough mixing of ingredients, are the two things that will produce good results.

ELIXIR CURASSAO, N. F.

BY HENRY C. BLAIR.

Assuming that this preparation is intended to replace the genuine imported curacao cordial, it is strange that it resembles it in no way.

In appearance, color, odor and taste, it is entirely different.

It is too acid to be used as a vehicle for the various medicines that are usually prescribed with it.

It is almost impossible to get curacao oil, or oil of mandarin from jobbers, and the average pharmacist uses neither of these oils.

Oil of sweet orange is quite as agreeable, and is found in stock in all drug stores, therefore, the formula for spirits of curacao should be changed to oil of sweet orange.

The formula of the N. F. calls for two U. S. P. preparations, and one N. F. preparation; these take time, and cost money to make.

In deciding on formulæ for either the U. S. P. or the N. F., three things should be considered; cost, labor and time; as well as the ingredients, their therapeutic value, purity, palatability, etc.

Knowing the faults of this preparation it would be useless to simply call attention to them without offering a remedy.

The following formula is therefore suggested as the preparation is nearly like the imported curacao cordial in appearance, color, odor and taste.

Oil of orange (sweet)	2.5 Cc.
Sherry wine (Spanish)	20. Cc.
Jamaica rum (imported)	30. Cc.
Sugar	500. Gm.
Alcohol	400. Cc.
Caramel q. s.	
Talc q. s.	
Water	q. s. ad. 1000. Cc.

Agitate the oil, alcohol, wine, rum, sugar and water, until the sugar is dissolved, add the caramel and talc, and filter.

SOME INTERESTING PRESCRIPTION INCOMPATIBILITIES.

BY WILLIAM J. ROBINSON, M. D., NEW YORK, N. Y.

Prescription incompatibilities we should always have with us, and there is no subject in pharmacy which is or should be of greater interest to the true professional pharmacist. A thorough knowledge of incompatibilities is a badge of distinction which serves to differentiate the truly professional pharmacist from his soda-dispensing, nostrum-vending brother.

A person's reputation, good or bad, dies hard, and though I have not been connected with pharmacy for quite some time I am still daily in receipt of telephonic or written messages requesting aid in distinguishing knotty points in prescriptions.

And from these prescriptions I will present a few to the members of this Association.

R Potassii permangan.....	3j.
Formaldehyd.	℥j.
Aquæ	℥vj.
S. Apply externally as directed.	

You know *a priori* what would happen when such a strong oxidizing agent as potassium permanganate and such a strong reducing agent like formaldehyde are mixed. Both substances are completely destroyed; within a very short time the mixture loses its color and a precipitate of potassium manganate and manganese dioxide is at the bottom. The prescription is absolutely incompatible, and should not be dispensed.

I happened to know the druggist who received the prescription and the doctor who wrote it very well. I asked the latter what made him order the two substances together, and he told me that he had a very obstinate case of bromidrosis (fetid sweating) of the feet; that he had read that potassium permanganate was very good for this condition and so was formaldehyde, and he thought that by prescribing the two he would make a stronger and more efficient combination. More than once we have had occasion to comment upon the fact that physicians, both young and old, desiring to prescribe a particularly strong combination and get the effect of several drugs, destroy them altogether and get the effects of none.

R Sodii salicyl.	
Potassii bicarbon.....	āā ℥ss.
Milk of magnesia (Phillips).....	℥iij.
S. Teaspoonful three times a day.	

Sometimes peculiar reactions occur where you least expect them. The druggist who handed me the above prescription told me that it formed a combination absolutely unfit to be dispensed. He said that soon after mixing the ingredients a heavy sediment formed, but the strange part of it was that the sediment was *black*, like charcoal or black oxide of manganese. I was somewhat skeptical; asked him whether he was careful not to bring the salicylate in contact with some iron preparation, etc. He said he took every precaution, made the prescription twice, and with the same result. I then, in my laboratory, made up the prescription and found the druggist's statement correct. The sediment consisted of two portions, one crystalline, the other amorphous, and it was of a deep black. On standing, the contents of the bottle separated into two layers of about equal volume. A lower layer consists of a somewhat muddy sediment, and the supernatant liquid is *black*, just like ink. As the exact composition of Phillips' milk of magnesia is a trade secret, I am unable to state what the exact reaction is. The prescription cannot be dispensed. Of course we know that sodium

salicylate darkens in the presence of an alkali, but it never gets so black, and the reaction does not occur in the presence of the potassium bicarbonate alone.

R Thiocol.....	3 iij.
Tr. ferri chlor.....	3 ij.
Syr. simpl.....	3 j.
Aquæ q. s. ad.....	3 ij.
S. Teaspoonful four times a day.	

Thiocol is chemically potassium guaiacol-sulphonate (the potassium salt of ortho guaiacol-sulphonic acid). Being very soluble in water, it strikes at once a deep blue color when brought into contact with a ferric salt. It is well to inform the physician of the resulting action. If he has no objection to the blue color of the solution, the prescription may be dispensed. Nothing poisonous is formed, and the therapeutic value of the ingredients is hardly affected. The chances, however, are that the physician would order the iron left out. It was so in the above case.

R Sol. adrenalin chlor.	3 iij.
Argenti nitr.....	gr. iv.
Aquæ destill.....	3 iv.
Sig. Inject 3 times a day after urinating.	

Physicians have been cautioned a number of times not to prescribe new remedies in combination with other substances, until they have become thoroughly familiar with their chemical properties and incompatibilities. The above prescription is worthless. Adrenalin is a very strong reducing agent. It reduces the nitrate of silver, and what is worse, it itself becomes reduced and inert. It is also to be borne in mind that the vehicle in which the adrenalin is dissolved is a physiologic salt solution, *i. e.*, 0.7 per cent. solution of sodium chloride, and this will of course precipitate the silver as silver chloride. But, I repeat, even pure adrenalin is incompatible with inorganic silver salts.

R Natrii iodidi.	
Natrii salicyl	āā 0.2
Quin. sulph.	0.06
M. f. Caps. Tal. Dos. No. xii.	

I have now before me the box of capsules, or rather of what was once capsules. The contents of the capsules, the capsules themselves, the cotton in the box and the bottom of the latter form one agglutinated mass. And the only trouble in compounding that prescription was this: The druggist triturated the powders vigorously before filling the capsules. The best way is to powder the sodium iodide, mix it with a little althæa, then with the other powders (gently) and fill. Under these circumstances there will be no liberation of the water of crystallization.

R	Hydrargyri bichlor.....	gr. xvi.
	Glyco-thymoline	℥ vj.
	Aquae	℥ ij.
	S. Mix with two parts of water and apply externally.	

This prescription is incompatible. Borax being one of the constituents of glyco-thymoline, the mercuric chloride is precipitated either as mercuric borate or as mercuric oxychloride; this depending upon the relative quantities of the ingredients and upon the order of mixing. I might add here, that very small quantities of mercuric chloride and glyco-thymoline are compatible; the relatively large percentage of glycerin in the glyco-thymoline preventing precipitation.

R	Potassii iodidi.....	℥ ij.
	Bismuthi subnitratis	℥ iij.
	Strychninae sulph.....	gr. i.
	Syr. simpl.	℥ ss.
	Aquae q. s. ad.....	℥ iv.
	S. ℥i t. i. d. p. c.	

There is a double incompatibility here. The potassium iodide will precipitate the strychnine as strychnine iodide and besides the *red iodide* of bismuth will form. The physician should be consulted.

R	Bismuth subnitr.	℥ ij.
	Sodii salicyl.	℥ ij.
	Pepsini puri	℥ j.
	Aquae menthae pip.....	℥ iij.

It is stated that the bismuth subnitrate gradually turns red owing to the formation of the red nitrosalicylate of bismuth. This has not been our experience. The mixture retains its original white color.

R	Zinci oxidi.....	15.00
	Gelatini	3.00
	Glycerini	40.00
	Aque.	50.00
	M. f. pasta.	

The formula is similar to Unna's "Zinkleim," used so much in the treatment of varicose ulcers, various skin diseases, etc. Unna's formula is as follows:

Zinc oxide.	
Gelatin, white	āā 30.00
Glycerin.	50.00
Distilled water.....	90.00

The gelatin is added to the water, heated on a water-bath until completely dissolved, then mixed with the glycerin and finely powdered zinc

oxide is sifted in and well stirred or shaken. The mass solidifies and must be heated before application. It is applied with a brush, and in a few minutes a protective covering forms, which may be left on for many days.

R	Creosoti	℥j.
	Lactis condensati	℥ iss.
	Ol. cinnamoni	gtt. viij.
	Aque.....	ad. ℥ vj.

Condensed milk makes a good vehicle for creosote. It is best to triturate first the condensed milk with about an ounce of water, then incorporate the creosote and the oil and the rest of the water.

R	Betanaphthol	30.00
	Sulphuris	20.00
	Bals. peruv	30.00
	Petrolati	30.00
	M. f. unguentum.	

Balsam of Peru is not well miscible with petrolatum, and, on standing, this ointment separates. It may, however, be dispensed, the patient being instructed to stir the ointment with a glass rod before using.

R	Apomorphinæ hydrochlor.....	gr. j.
	Liq. ammon. acetatis	℥ j.
	Sp. ætheris nitrosi	℥ ss.
	Vini ipecac.....	℥ ij.
	Aque dest.....	ad. ℥ vj.
	Dessertspoonful 3 times a day.	

This mixture turns green very rapidly. It is due to the oxidation of the apomorphine. Some consider the nitrous ether the disturbing factor; I am inclined to think that the fault is due chiefly to the alkaline solution of ammonium acetate. The mixture may be dispensed. While I would not care to administer green apomorphine hypodermically, I would not hesitate to do so per os.

R	Sodium salicylate	4	drachms.
	Tincture of ferric chloride.....	4	drachms.
	Oil of wintergreen	10	drops.
-	Citric acid	10	drops.
	Glycerin	1½	ounces.
	Sol. of ammonium acetate up to.....	4	ounces.

This prescription shows the value of knowledge of dispensing. If the sodium salicylate is mixed directly with the tincture of iron, ferric salicylate will form and will precipitate. We will also get an unsightly precipitate if we add the alkaline solution of ammonium acetate directly to the

iron. The mixture can, however, be dispensed in a presentable form if made up as follows: Dissolve the sodium salicylate and the citric acid in the solution of ammonium acetate; in another vessel mix the glycerin and the tincture of ferric chloride; then mix the two solutions and add the oil the last thing. The mixture will stand any length of time without changing, even if exposed to heat, cold, or light. In the first solution a small quantity of salicylic acid may separate and this may be filtered out.

R	Cocainæ hydrochlor.....	gr. vj.
	Menthol	gr. v.
	Glycerini.....	3j.
	Aquæ destill	3j.
	S. Use with nasal spray.	

What chemical reaction is the turbidity due to? asks the druggist who sends in the prescription, but the turbidity is not due to any chemical reaction. It is due to the insolubility or very slight solubility of the menthol in the water. If menthol is wanted for a spray in the nose it should be dissolved in some fixed oil. If cocaine is also wanted in the same prescription, the alkaloid cocaine should be taken, (and not any of the cocaine salts.) The alkaloid cocaine is soluble in fluid oils, the cocaine salts are not.

R	Protargol	0.5
	Aquæ destill	200.0
	S. Use as an injection as directed.	

There is no incompatibility here, but it is necessary to know how to make a solution of protargol properly. Either of the two following ways is satisfactory: Stir the protargol into a smooth, thick paste with a little cold water, and then add the bulk of the fluid. This should be done in a glass or china vessel, using a glass rod; if in a mortar, the latter as well as the pestle should be slightly moistened with a few drops of glycerin. Or dust the powder evenly upon the surface of the water and allow the fluid to stand without stirring for about ten minutes. It is essential that only cold water be used in making protargol solutions, as with hot or warm water the drug is to some extent decomposed, becomes less active and may even cause irritation.

R	Liq. Iodi Compos	3j.
•	Liq. Potassae	3iij.
	Apply with toothpick to (ingrown) toe nail.	

The potassium hydroxide combines with the free iodine of the Lugol's Solution, converting it into iodide and iodate of potassium, and the solution becomes colorless.

R	Phenyl. salicylatis	℥j.
	Spir. aetheris nitr.	℥iv.
	Tinct. ferri chlor.....	℥iv.
	Glycerin	℥j.
	Syrupi,	℥j.
	Aquæ ad.....	℥vj.
	S. \mathfrak{zss} every three hours.	

The color of this mixture will depend upon the order of mixing. If the salol is dissolved in the spirit of nitrous ether and then mixed with the tincture of iron the mixture will have a dark violet color. If, however, the salol is suspended in the glycerin and a portion of the water, the tincture of iron mixed with the syrup added and then the other ingredients, the mixture will have a much lighter and less changeable color.

R	Argenti nitrici	0.1.
	Alypini	0.3.
	Aquæ destill.	100.0.
	Inject as directed.	

This prescription is incompatible. Alypin is chemically benzoyl-tetramethyl diaminoethyl isopropyl alcohol hydrochloride. There is, of course, a precipitate of silver chloride formed, which is of little value as an antitiblenorrhagic. There is now an alypin nitrate on the market, and whenever it is desired to combine the local anesthetic properties of alypin with silver nitrate this salt should be prescribed.

HEAT AND ITS UTILITY AT THE COMPOUNDING AND DISPENSING COUNTERS.

BY FRANK E. FISK.

The above topic, if submitted to the American pharmacists for discussion, would doubtlessly furnish an interesting symposium. What force is there, whose sphere of usefulness is more extensive, and yet whose actual use by "Knights of the Mortar and Pestle" is more varied both as to extent and manner of use? As with other things, a clearer conception of its vastness and diversity may best be gleaned by observance of the rôle it plays in the panorama of changes that are ever being wrought in the laboratory of nature. For instance, go to the sea, whose depths immeasurable harbor some thirty-three of the elementary bodies in some form, aside from those comprising its bulk. While accounting for these, amounting (numerically) to half the world, who would attempt to trace or enumerate the instances where heat has been a factor or note the processes closely resembling those of our laboratories?

Quite naturally, in endeavoring to trace the source of these substances which in an elementary sense comprise half the world, we begin where we find them, at the sea, and note through vaporization induced by *solar*

heat, portions in the ethereal form, guided by nature's law of gravitation, ascend to a loftier and lighter atmosphere, to be wafted "hither and yon," until, encountered by a lower temperature, its physical nature is changed to a liquid or solid state, to be again precipitated to earth as snow or rain. These in turn yield to the seductive influence of the sun's warm rays and resume their original form of water, and start on the return voyage to the sea, descending by the "*percolation route*," through the crust of the earth to varying depths, contributing often to the development of the vegetable kingdom, when supplemented with sufficient heat, but continuing its onward course, changing its chemical nature from time to time as it encounters its affinity, now on a spring on the mountain, then a babbling brook in the valley, again a rivulet, becoming more pretentious as a river which in due course of time reaches its home the sea, charged with its full share of inorganic matter which marks its travels, and contributes its portion to the composite compound known as the briny deep.

THE VALUE OF AN ANCIENT ERROR.

The error of the ancient alchemists in ascribing to *water, fire and air*, the distinctive classification of *elements*, while erroneous according to the scientific nomenclature of more recent ages, was nevertheless in harmony with their mode of reasoning, and so true in a figurative sense as to bid fair to survive many of the literal truths, such potent factors have these agents ever been in solving by nature's laws and methods, many of the great, and through man's aid, many of the smaller though more perplexing problems of this life.

TEMPERATURE VERSUS VOLUME AND WEIGHT.

While a proper knowledge of the relationship of temperature to volume and specific weight is often taken advantage of by the thoughtful pharmacist in the preservation, restoration and clarification of certain types of drugs and preparations, of which the commoner are the concentrated fruit juices and syrups, crushed fruits etc., it quite as often happens that the operator, through ignorance or disregard of this relationship, finds disaster and loss following in the wake of good intentions.

In dealing with this class of substances, for instance, freshly prepared materials are prevented from undergoing fermentation and thus preserved by heating in a suitable vessel (preferably porcelain lined), to not exceeding 100 degrees Centigrade, thus increasing materially the volume, and decreasing correspondingly the specific gravity. At the same time their viscid character is overcome while coagulating the albuminous matter, which, if allowed to remain, would be likely to induce the decomposition through fermentation. The mere pouring of the liquid through a straining cloth of rather fine texture suffices to remove not only the coagulated albuminous matter but other foreign substances that may have been sus-

pended in the heavy substance because of similar specific gravity and the viscid character of the liquid at normal temperature.

CLARIFICATION.

By the mere application of heat carefully regulated by means of the water-bath or otherwise, many such substances may be clarified, the degree of heat used and the time being regulated according to the nature of the case in hand, the restoration of syrup, etc., requiring more time than the fresher substance. By this method advantage is taken of the increased volume and the decreased density, also the consequent greater mobility induced by elevation of temperature for the separation of other suspended impurities, while preservation is insured through.

COMPLETE STERILIZATION,

And the attention given to the preparation and filling of the containers. Inattention to details of the finishing touches, due to carelessness or ignorance of the law of temperature versus volume often spells disaster, following the complete filling of the container with the material after cooling and assuming the minimum volume, to later explode when the maximum volume of a much higher temperature is reached.

THE FIRMER FATS AND ANALOGOUS SUBSTANCES.

Probably no class of substances with which the pharmacist has to deal affords so little self-satisfaction, or is more often neglected than this fatty acid group, which fact of itself indicates quite clearly the opportunity which they offer for distinction in manipulations pharmaceutical. That these substances emanate from and connect through their elementary and proximate constituents, the *kingdoms of the earth* should certainly not detract from them the interest of the people in general, while pharmacists should find in them objects of special interest, since through his handicraft they are made to supply a goodly portion of our external *Materia Medica*, serving these numerous purposes well or ill, according to the skill with which they are handled by the medical fraternity and others through whose hands they pass.

THE FUNCTIONS OF HEAT AND COLD.

In our dealings with these fatty factors, olein, palmitin and stearin, which comprise the bulk of the substances in question, such as lard, suet, tallow, wool-fat (hydrous), spermaceti, wax, paraffines, petrolatum, in its various forms, cocoa-butter, and the fixed oils from all sources, the use of heat at varying temperatures, is so very important as to obviate the necessity of most other agencies. Fresh oils may be preserved by sterilization at 100 to 150 degrees Centigrade, those of firmer type, such as theobroma, cocoanut, spermaceti, suet, lard, wax, etc., being deprived of foreign substances, accidental impurities, etc., by maintaining a tempera-

ture of 100 degrees Centigrade, or sufficiently high to insure mobility during their filtration, through felt or paper without injury. Those of either class which have undergone the chemical change resulting in that state known as rancidity, may be restored by sterilization and washing with water at 100 degrees Centigrade, separating by the usual method, again washing with cold water rendered slightly alkaline with potassium or sodium carbonate, again separating and again washing with cold distilled water, and finally separating.

THE USE OF COLD.

It not infrequently happens that the thinner oils of the olive type from fraudulent adulterations, accident or exposure to low temperature, especially in the last half of the container, are found to contain a translucent, lard-like substance along with the slightly lighter, transparent portions, usually due to a surplus of palmitin or stearin or a mixture of both which may be separated by placing container in freezing solution of salt and ice water for a few moments, then quickly decanting the liquid portion, olein, leaving the solidified portion, which with neetsfoot oil or castor oil, make an excellent dressing for leather.

THE HEAT FACTOR OF MISCIBILITY.

The varied forms assumed by many substances due to changes wrought, both physical and chemical, by the factor of heat alone, if studied closely in all their bearings and relationships, would furnish material for one or more volumes instead of a brief paragraph, it being the purpose of the rambling thoughts here expressed to call the attention of pharmacists to the utility of the instrument known as the chemist's thermometer in the every-day pursuit of their calling, and to wean them in a measure at least from the custom of divorcing themselves from all manipulations where heat or a fixed temperature is a factor, or following the worse alternative of ignoring the use of the all-important agent, which too often happens.

As an example of the latter class, I recall a visit to a rather prominent Chicago pharmacy in the capacity of salesman. Greeting the apprentice, I was informed that the buyer, whom I afterward learned was likewise the proprietor, was busy in the laboratory, which I was immediately and unceremoniously requested to enter.

Following a cordial greeting, I was assured that as soon as he could finish some boroglyceride he would be pleased to consider my proposition. After weighing the boric acid, which was the only use made of the balance, the glycerin was measured and placed in a granite-iron vessel over a gas furnace, the acid added at once, and stirred for a period of approximately ten minutes. The gas was turned off, an equivalent of glycerin added, transferred to a container of glass, which stood the test fortunately, and was then vigorously shaken with the object of effecting a solution of the remainder of the acid—and this an official compound with specific directions to the compounder.

The miscibility of oils, fats, etc., with each other, with resins, as well as with powdered drugs, as in cerate ointment and plaster making, is always greatly enhanced, and their manipulation facilitated by the proper use of heat. The extent or degree is governed by the fusion point of the base, as well as the temperature of the surrounding atmosphere, and the nature of the medicating substance. In each of the official classes above referred to, the Pharmacopœia stipulates the process or method of manipulation, whether by fusion or direct incorporation, but leaves largely to the operator's judgment the degree of heat or temperature to be used, as well as the exact method of procedure, the rule being equally applicable to the various unofficial formulæ encountered in everyday practice, making the minimum temperature the rule of its fusion methods.

A PROMOTER OF SOLUTION.

That the action of practically all solvents when applied to solids is increased by elevating the temperature is a conceded rule to which there are few exceptions, while on the other hand the advantages due to sterilization are greater mobility as a stepping-stone to filtration, clarification, etc., thus enabling the dispensing of clear and transparent permanent solutions without loss of time, instead of unsightly mixtures of uncertain strength.

The rule, therefore, for the use of heat in solution-making is one with many exceptions and modifications, among which may be noted, when there is a volatile constituent which is valuable, extreme solubility or deliquesence, calcium hydroxide, albumen, albumenates, and gases generally.

MAXIMS TO BE OBSERVED IN SOLUTION-MAKING.

In solution-making where heat is a factor the boiling-point of the solvent should be the maximum temperature employed as a rule, while in many instances a temperature midway between this and normal will serve an equally good purpose. In many instances the better and safer method is to raise the temperature of the solvent alone to the desired point, using an appropriate utensil or method for effecting the solution, taking cognizance always of the increased volume at the higher and consequent shrinkage at the lower or normal temperature, as well as the loss from vaporization, particularly in the making of percentage solutions, and especially when dealing with an hydro-alcoholic solvent.

ELABORATE VERSUS EXTEMPORIZED UTENSILS.

In the operations commonly performed in connection with dispensing stores, aside from the processes of assay required by the eighth revision of the U. S. P., very little elaborate apparatus is required, provided the operator possesses a little mechanical ingenuity, without which he will often find himself ever more at a loss with a lot of complicated paraphernalia, since

the utensils required beyond the usual store and laboratory equipment may be extemporized as occasion demands, from materials usually at hand at little or no cost, and made to serve the purpose even better than the more expensive, designed for the more frequent and extensive use of the pharmaceutical manufacturer.

The ordinary baths, such as water, sand, glycerin, etc., for special uses, tinned, iron crucibles, galvanized casseroles, etc., for exsiccating salts, etc., may be readily devised, while the displacement jar described by the author in a paper entitled "Circulatory Displacement as a Pharmaceutical Process," from the ordinary wide-mouth jar of the confectioner, properly tested and graduated, serves a variety of purposes in the compounding laboratory, such as receiving vessels for percolates, infusion and decoction mugs, wash bottles, and with slight modification they may be made to serve the purpose of crystallization and precipitation jars.

The size of these jars may vary from 250 to 4,000 Cc.'s, being adaptable to the special uses, source of heat, etc., all of which, when provided with an extra cork, perforated so as to support a chemical thermometer when necessary, will be found among the most practical utensils of the pharmacy. The actual

SOURCE OF HEAT

counts for little or nothing, the all-important factor being its utility under proper regulation and measurement, the aim of the author being to call attention to some of its more practical though often neglected functions in connection with the calling of the pharmacist.

Chicago, July 5, 1907.

CUTTING COMPOUNDING CORNERS, OR PHARMACEUTICAL ECONOMICS.

BY FRANK E. FISK.

A fair compensation for the time wasted through thoughtlessness of compounders in the United States alone would not only replenish the exchequer of the American Pharmaceutical Association to the limit of the most optimistic, but furnish suitable monuments for the more illustrious of its departed membership. Strangely enough, too, this form of extravagance is likely to attach to the most successful of proprietors who chance to be especially fortunate in the selection of their employees.

THE SWIFT VERSUS THE SLOW COMPOUNDER.

The "rattlety-bang" man with his "*lick and a promise*" methods may impress the casual observer as swift, and keep a second clerk and apprentice or two busy replacing the stock and cleansing utensils, while, if measured by his individual accomplishments will be found decidedly wanting, both as to quantity and quality of labor performed, oftener than otherwise. On the contrary, Mr. Slow with his more thoughtful and deliberate method

of procedure will be found with far more to his credit unaided, with a record of seldom if ever making a serious error. Cutting the Corners at the Prescription Department, usually depends upon one of two ways of exercising one's forethought a little.

PREVIOUS PLANNING

where a number of prescriptions are to be dealt with, often amounting to a material saving of both time and labor on the part of the compounder, as well as to lighten the labor of the apprentice. For example, an array such as this, powders of the mercurous chloride with sodium bicarbonate, capsules of acetphenetidin with caffein and phenyl-salicylate, a nasal spray of menthol ol. eucalyptus, and petrolatum liquidum, and a mixture of tr. myrrh, honey, phenol, potass. chlorate and water, may all be properly and expeditiously dispensed with a small graduate, a moderate size mortar and pestle, a spatula and towel, without a trip to the sink or overburdening an apprentice, particularly if the better method of weighing the honey into the warm dry mortar to which the tr. myrrh and phenol are added, followed by the potassium chlorate in solution, which for this particular formula and various modifications of it, is "secundum artem."

CLEANLY CALCULATIONS.

In dealing with the fixed and volatile oils as in the art of emulsion making, much time and labor may be saved and uncleanness avoided by the use of

THE BALANCE

instead of the less cleanly as well as less accurate method of measuring such substances. As an example of an oft occurring type, take the new official emulsum olei morrhuae cum hypophosphitibus. By dissolving the hypophosphites in the dispensing bottle, adding the syrup, weighing the oil and acacia in dry mortar, adding the flavoring oil, rubbing as per official directions, adding gradually from dispensing bottle the solution of the hypophosphites and syrup and water q. s. to measure, and transferring emulsion to dispensing bottle.

It is needless to say that in all such cases the specific gravity of the oils must be taken into account though the fluid ounce of most oils at normal temperature, will be found very close to the avoirdupois ounce weight, the difference of about eighteen grains or 4 per cent. approximately offsetting the discrepancy in gravity. This method is applicable, not only to the compounding of emulsion prescriptions, but to the general dispensing of such drugs, thus avoiding the annoyance of imperfectly cleansed graduates, after such use, the difficulty often extending to other graduates and utensils, through contact with the unsuspecting if not unskilled apprentice.

SIZING SITUATIONS.

The dependable apothecary after all is he who is ever in such close

touch with his stock, that a glance at a prescription and a side glance at the stock container, will decide whether compounding must or should precede dispensing or not, and proceeds accordingly.

For instance, a recipe for an unusual quantity of brown mixture is handed him ; the container for this rather unstable compound appears to be minus the needful in quantity, if not below par in quality, hence he proceeds to weigh his equivalent of acacia, ext. glycyrrhizæ and sugar, lest his mucilage, too, be defective ; triturates, gradually adding the wine of antimony, camphorated tincture, spirit of nitrous ether and the other ingredients of the prescription, the same rule applying to many of the regular galenicals of the Pharmacopœia, particularly such as are presumed to be prepared often, if not as required only, the customer tending to enhance the pharmacist's skill as well as the potency of his products.

TOO MANY TOOLS.

Among the commoner shortcomings of "Knights of the Mortar and Pestle" is the possession of a superabundance of utensils of special types, for after all the calling is one that requires, to a certain extent at least, the genius of the mechanic and the training of the artisan, both of which are dwarfed and discouraged by a superfluous equipment, which tends to make of the pharmacist a sort of machine, whose duty is the doing of just certain things by a fixed set of rules, which are not always readily adaptable to surroundings, and which therefore limit his sphere of usefulness by locking the wheels of progress, which are wont to run smoothest, at least, along the avenue of inventive genius.

Chicago, July 18, 1907.

MINUTES

OF THE

SECTION ON EDUCATION AND LEGISLATION.

FIRST SESSION—WEDNESDAY MORNING, SEPTEMBER 4, 1907.

Chairman Oldberg, of Chicago, called the Section on Education and Legislation to order at 10:30 a. m., and requested Secretary England to preside while he read his address:

ADDRESS OF THE CHAIRMAN.

Fellow-Members: At our annual meeting a year ago practically all of the time of this Section was devoted to the consideration of certain general principles, which, if given recognition and effect, as circumstances permit, cannot fail to greatly improve the condition of pharmacy and pharmacists. The propositions submitted were all endorsed by this Section, and on the following day by the Joint Conference of the State Boards of Pharmacy and the Pharmaceutical Faculties. The Joint Conference further adopted certain additional propositions of a similar character.

Attention was called to some of the most serious defects in our pharmacy laws, the absence of tangible standards of education for the practice of pharmacy in nearly all our states, and the bewildering differences and contradictory requirements of different states. The object sought was to discover in what directions a beginning might be made to bring about a healthier condition.

The general propositions which were endorsed by the meetings at Indianapolis are to be found in the published proceedings. They are self-explanatory and moderate.

It was not to be expected that the first effort to awaken serious interest in this important question would bring immediate results. The actual condition of things was not generally known. Many who were present at those meetings were taken by surprise and were not ready to express their judgment. Many mistakenly thought it was proposed to ask the boards of pharmacy to take some action not sanctioned by existing laws. But, as was clearly stated at the time, the propositions submitted were simply "recommendations to all concerned that the principles and standards set forth be adhered to in any amendments to the pharmacy laws hereafter proposed, and that the boards of pharmacy employ the discretionary powers already conferred upon them by law to improve the educational status of the pharmacists of the future."

One of the propositions which in a somewhat amended form set machinery in motion to aid us was that providing for the preparation of a syllabus of subjects or studies to serve as a general guide toward some degree of uniformity in the scope of college courses and board examinations. A plan is being carefully worked out by the Syllabus Committee which was appointed.

Another of the propositions adopted by this Section was radically changed by the Association of boards of pharmacy, namely, that which sought to pave the way for identical examinations in all states. From the comments made upon it it is evident that its failure of adoption in its original form was largely if not wholly due to a misunderstanding of its language and purport. Many thought that its adoption would amount to an attempt to make registration in one state equivalent to registration in all states, whereas, it simply proposed that questions suitable for use in the board examinations be prepared by a national committee appointed by the association of boards, which questions could be used *by such boards as may choose to adopt them* in order to facilitate a gradual approach toward uniformity of examinations—not an interchange of certificates of registration. An interchange of state certificates of registration can, of course, be effected only by making the laws uniform in all requirements for license. I am still convinced that some day the board examinations will be made uniform or identical in at least a large number of the states, so that when a candidate has passed the examination in one state he has passed in the others, and the certificate of one state, that he has passed that examination will relieve him from another examination should he remove to another state.

The most formidable obstacles to progress are the inertia which keeps us in ignorance of our duty, and the selfish indifference which bids us shift that duty upon the shoulders of others. Our inertia and indifference have deterred us from seeing and resolutely attacking the evils which are casting discredit upon us. Each one of us must bear his share of the odium from which the whole body of our craft suffers. United we stand; divided we fall. We are permitting our occupation and ourselves to be misrepresented by the humiliating absurdities and inconsistencies of the laws.

The situation is growing more acute as time passes. A year ago it seemed evident to me that "the agitation of the quack nostrum evil, the enactment of pure food and drugs acts, the public awakening to the abuse of habit-producing drugs—these and other topics of the day must sooner or later place the pharmacy laws and the practice of pharmacy in the limelight. The public will then discover the wretchedly low standards of education for pharmacy and will inevitably proceed to change them without consulting us."

CAN WE PASS MUSTER ?

During the year passed since that warning was uttered a strong movement has been going on to establish more satisfactory relations between physicians and pharmacists. The physicians started this movement; but the pharmacists have eagerly seconded it, as might naturally be expected. Leaders in the medical profession propose to carry on their propaganda to counteract the exploitation of secret or partially secret ready-made medicinal preparations and worthless drugs, and in favor of the restoration of pharmacopœia and other known standard medicines to their rightful place. They propose too, that the services of the pharmacist shall be once more given full recognition.

Now let us put two and two together. What the physicians have set out to do is to make war upon deception and graft. They seek to secure instead honest, intelligent, ethical pharmacy, free from sham.

It is self-evident that the services and products of the druggist must be judged by the same standards that are applied to those of the manufacturer. Physicians will, therefore, ask the question: Can the pharmacists be depended upon to render intelligent and satisfactory service? How will they find an answer to their question? Certainly not by trying to get acquainted with us individually, for that is clearly an impossible task. No. They will naturally conclude that the most direct, easily obtained and reliable evidence by which they can judge us must be the legally established requirements for license to practice pharmacy, and our own attitude toward reasonably satisfactory educational standards.

Can there be any doubt what their verdict will be when they discover that the ranks of pharmacy are recruited from the primary schools, and that the efforts made to lessen this evil in a slight degree are apparently resisted by the druggists themselves; that the pharmacy laws do not contain any educational requirements except the general proviso that only "qualified" persons shall be licensed; that the rules and regulations of the Boards of Pharmacy so far as any such rules and regulations exist, fail to prescribe any definite kind or amount of education; and that no effective efforts have been inaugurated by the American Pharmaceutical Association or any other body of representative pharmacists to correct this condition of affairs? Will not such a discovery cause the physicians to hesitate to depend upon the pharmacist? Will it not end the movement we have welcomed with so much satisfaction?

How shall we be able to defend ourselves? Only by going to work earnestly and persistently to end the neglect of which we have so long been guilty.

The statement that American druggists are generally better educated and qualified for their duties than the laws prescribe is not a sufficient defense. The passing of resolutions will not set us right.

A reasonable appropriation of money should be made by this Association to support an active, persistent propaganda of reform that will have a tendency to convince the physicians that we are in earnest. Our By-laws should be so amended as to provide for the election of a Secretary of the Section on Education and Legislation who shall serve from year to year as long as his services are efficiently performed, who should be selected with reference to his special fitness, who should collect statistics, correspond with pharmaceutical associations, Boards of Pharmacy, pharmaceutical schools and others directly interested in pharmaceutical education and legislation, and who should annually report to this Section upon the status of laws relating to pharmacy, and changes in educational and other requirements together with such suggestions as he may deem appropriate—all with the view to find the way to gradual betterment.

Some of the most glaring defects of our pharmacy laws can be easily removed if the effort be made. For instance, no legislature would refuse to pass a law declaring it unlawful for any minor to conduct a drug store on his own responsibility, to have unrestricted charge of the dispensing of all kinds of medicines, however potent, and to sell cocaine, morphine and other drugs which have wrecked thousands of victims by their habit-producing effects. Do you know that this wrong is explicitly legalized in at least eight states?

The Board of Pharmacy of Wisconsin, be it said to its honor, decided, with the ultimate concurrence of the druggists of the state, that as the pharmacy law was enacted or the purpose of placing the dangerous business of dispensing medicines in the hands of intelligent and safe men, therefore it necessarily makes it the duty of the Board, and confers upon it the power, to prescribe in plain terms, the specific qualifications which candidates for license must possess.

I had occasion a few years ago to examine the decisions of courts of record upon the constitutionality of pharmacy laws. Those decisions all uphold the pharmacy laws on the ground that they are intended to protect the public and have no other purpose, and that the protection sought by them is necessary. All but two of these laws fail to go into any specific details as to educational requirements except that some of them explicitly authorize the licensing of graduates of pharmacy without examination under certain conditions.

The pharmacy laws unmistakably make it the duty of the Boards to prescribe the kind and amount of education required. If any State Board has any doubt on that question let it make official application to the Attorney-General of its State for his legal opinion.

PRELIMINARY EDUCATION.

Friends of pharmacy have recommended that "one year's high school work, or its equivalent," be adopted as the minimum of preliminary general education. Any reasonable man of that much education knows what is meant by it. Anybody can readily get definite and up to date information on the subject from reliable sources. One year's high school work means not less than the usual amount of school work covering the ground usually covered by studies of the well understood grade commonly prescribed for the courses in the secondary schools, and which may not be undertaken until after the completion of the primary school courses.

The plea is made that the poor but bright boy who is obliged to go to work to earn his living before he has acquired sufficient schooling to successfully pursue such studies as are necessary to pharmacy, should have the right to make up for his deficient preparatory mental equipment concurrently with his college course. But how can he accomplish more than twelve months' work and attain more than twelve months' growth in twelve months? Much as I sympathize with the "poor but bright boy," I cannot think that he should be unconditionally allowed to experiment on the public health. The free public school is not only the cheapest but the best school in which to get the preliminary education. To pay college fees for public school instruction imparted by teachers who are not accustomed to give such instruction would be unusual. Such a plan is quite impracticable. Boys without any preliminary education, whether rich or poor, are not allowed to enter the professions of law or medicine. Shall we demand that they be admitted to those professions? Are we not, instead, willing to admit that in all things the welfare of the community requires certain restrictions upon personal liberty?

We are told that boys who have been one year in high school feel themselves to be above the duties required of drug clerks. In other words, we are asked to believe that the members of this Association and all other druggists either had less education than that or were forced into pharmacy against their will, unless pharmacy was more attractive when you and I were young. But if pharmacy is no longer attractive to boys as far advanced in education as those of the first year class in a high school, how far down must the standard of education be put? Would not the high school boys be more inclined to go into drug stores if illiterates were excluded?

No one proposes that druggists shall be barred from employing any kind of cheap labor to do the work that cheap labor can do; but we should not permit that cheap labor to crowd us out of our occupation.

In at least one school of pharmacy all matriculants are required to have a completed high school education, or its equivalent; in several other pharmacy schools they must show two years' high school education; in over thirty such schools they are now required to have had at least one year's high school work before they are admitted; and in one school where one year's high school work is all that is necessary for admission, over 40 per cent. of the students last year were high school graduates. Nearly all the students of those schools come from the drug stores, and nearly all of them return to the drug stores upon the completion of their studies.

Educational requirements have little or nothing to do with the scarcity of drug clerks. One of its causes is the unprecedented demand for labor which absorbs all the supply. Another, and a serious one, is to be found in the unreasonably long hours of druggists and their clerks. There can be no necessity for keeping the drug-stores open later at night than other stores are open, and it would be well to inquire into the question of whether any financial gain results from keeping open shop until near midnight.

A short time ago I visited a thriving city of 25,000 inhabitants. All the stores in that city closed at six o'clock p. m., except the drug-stores, which were kept open until 11

o'clock. There were no saloons in that town. The drug clerks received materially higher wages than the other clerks: but it was very difficult to induce young men to go into the drug-stores to work four or five hours after all the other young men of their acquaintance were free from their daily toil.

A third and potent cause of the scarcity of drug clerks is the fact that the laws and the boards provide us with too many full-fledged "registered pharmacists" and too few "registered assistants," if any.

REAL EDUCATION.

Education consists of the orderly and harmonious development of the faculties to the end, that they may be more effectively used.

Loading the memory with facts, however important and useful these facts may be, is not education.

The ability to answer promptly any number of questions by simply repeating definitions and statements memorized from books is no evidence of mental efficiency.

We are told that the subjects studied in the high schools are of no use to the pharmacist. The sufficient answer is that a variety of studies are necessary to mental development, and that the subjects taught in the public schools are selected with that fact in mind. The chief objects of that school work are the mental discipline and growth.

Children are not born equipped with mental machinery in good working order. Mentally as well as physically, they must have a sufficient amount of proper food and exercise and time to grow. They must creep before they can walk. Strength comes to mind as well as to muscle by judicious use.

The educated man is he who understands; who sees all there is to be seen, but nothing else; who hears with his ears and not with his imagination; who is not deceived by his senses; who knows where and how to find such information as he wants, and what to do with it when he finds it. Such a man is an efficient man, a practical man. The building up of such a man requires first of all good mental digestion and assimilation acquired by sufficient preparatory general education. After that preparation it further requires not reading alone, not listening alone, not laboratory work alone, but all of these and more. The student must especially be taught to understand and apply general principles, he must be drilled in solving the problems of actual work; he must learn to do things, to get results.

The studies included in the usual college course in pharmacy afford unsurpassed material and opportunity for real all-around development, provided the student's preliminary mental discipline in other schools has been sufficient to fit him to undertake these studies with reasonably good prospects of success. Without that preliminary tilling of the soil the crop that may be grown in the college of pharmacy is scant indeed.

The course in a college of pharmacy usually consists of two annual sessions of six months each, with eleven hundred hours' total instruction. The whole of that time could be profitably employed upon chemistry alone. It is scarcely sufficient to give the student a fair *general knowledge* of all the several subjects taught. The acquisition of that general knowledge demands so large a share of the allotted time that an additional accumulation of many disconnected facts in the memory is out of the question. All the facts the student learns in a good school of pharmacy are those necessary to his real education, and only such other extremely important facts about commonly used medicinal substances as he must have at his command at all times.

Not more than fifty hours is usually devoted to the lectures on materia medica in a pharmacy school. There are a thousand medicinal substances in the Pharmacopœia. No student can commit to memory the names, sources, character, properties, uses and doses of all the official drugs so as to be able to answer questions about them before the Board of Pharmacy if at the same time he attends to the much more important task of

acquiring an education. If he can, how much more intelligent would the accomplishment of that remarkable feat make him?

Memory is treacherous. At the dispensing table it is better as a general rule not to depend too much upon the memory. A prescription clerk who deems it necessary to look up the dose of tincture of gelsemium may certainly be a safer man than one who can state it off-hand; and one who can repeat from memory a statement which he does not understand might as well never have committed it to memory.

THE CONDITION OF MEDICAL EDUCATION.

Some zealous friends of pharmacy seem to think that the charge that practically no education is legally prescribed for pharmacy may be summarily disposed of by the counter charge that ignorant and incompetent physicians are as numerous as ignorant and incompetent pharmacists. Well, I have met many ignorant, incompetent and dishonest men calling themselves physicians and legally licensed to practice medicine, just as I have met many ignorant, incompetent and dishonest men calling themselves pharmacists and legally licensed to practice pharmacy. But that is beside the question. The neighbor's sin is no excuse for our own. Besides, our neighbor, the medical profession, is now making vigorous war on the ignorance and incompetence in its ranks and upon unfit so-called medical schools. By so doing it stands relieved of all blame.

The Council on Education of the American Medical Association has been investigating the condition of medical education for three years. They found only one-half of the 160 medical schools of our country to be good schools. They thought that another 30 per cent. of the medical colleges might be capable of sufficient improvement to be made useful. They found 20 per cent. hopelessly unfit. They found that the good schools are almost always conducted at a financial loss. They found that all schools conducted at a pecuniary profit are bad. They concluded that great endowments, gifts, annual appropriations or already accumulated property in the form of buildings, equipments and other like aids are necessary, in addition to the revenues from considerable classes, to maintain medical schools in a state of creditable efficiency. They recommend that an effort be made to place all such institutions under government supervision.

THE SCHOOLS OF PHARMACY.

I have no doubt similar conditions would, upon investigation, be found to exist among our 90 pharmaceutical schools.

The statistics collected last year by the Secretary of this Section indicate that there is need of reform in pharmaceutical education. Some of the newer schools of pharmacy, anxious to produce a favorable impression, report a program of 50 hours' instruction weekly to each student, or more than twice as much as given by the best known older schools, and about 40 per cent. more than the standard adopted by the medical schools. I do not hesitate to express the opinion that a program of 10 hours' school work daily, five days weekly, is impossible.

At its last annual meeting the National Association of Retail Druggists adopted a resolution calling upon the Boards of Pharmacy to demand that the colleges of pharmacy include a number of years drug store experience among the requirements for graduation. I have no doubt that those who voted for the resolution did so in the belief that they were simply giving expression to their conviction that drug store experience is a necessary part of the training of all pharmacists. But no one disputes that proposition. The most simple and direct method of securing that practical experience is, however, to require that every candidate for license, be he a graduate or non-graduate, shall produce direct evidence of it to the Board of Pharmacy.

Systematic courses of education for pharmacy are quite impossible except in special schools. The oft-repeated statement that practical pharmacy can not be taught in a

college is clearly absurd. Probably all schools of pharmacy have experienced pharmacists in the faculties, and if any of them have not they will doubtless secure them if the Boards of Pharmacy demand it.

THE BOARDS OF PHARMACY.

The Boards of Pharmacy apparently do not yet realize their own dignity, importance, powers and duties. The reason is obvious. It is that they are not decently compensated for their services. There is nothing in it for them except the glory. They are not paid enough to feel that they should study their duties and raise their standing up to the level of that of other state commissions having important public interests in their charge.

I am thoroughly convinced that none but practical practising pharmacists should be members of the Boards of Pharmacy. They should be selected with care. Politics should have nothing to do with their appointment—least of all that species of politics which may be styled pharmaceutical politics.

A hostile attitude toward education should clearly debar any man from serving as a member of a Board of Pharmacy, but a genuine general friendly attitude toward honest education means neither an indiscriminate recognition of all schools, good or bad, nor any special favor toward any institution on the score of locality or on any other equally narrow grounds.

When nominations are made for appointments on the Board of Pharmacy, the names of proposed candidates should be published together with their age, education, experience in pharmacy and other qualifications, in time to afford all concerned an opportunity to express their judgment.

Members of the Boards of Pharmacy should rid themselves of the erroneous notion that their chief duty is that of examiners. It is in fact neither necessary nor advantageous that they should do the actual work of preparing questions and grading papers. Unless circumstances absolutely prevent it they should follow the example of the National Civil Service Commissioners and many other similar public bodies and employ men to perform those subordinate functions. It is not less absurd to insist that they must themselves prepare the printed questions and pass on the written answers than it would be to insist that they must personally attend to the clerical work connected with their functions. Their chief duties are general.

In many states the funds at the disposal of the Boards of Pharmacy are not sufficient to enable them to do all that an efficient public service demands; but the most important duties should receive attention before less important ones are undertaken. The most important duties of every Board of Pharmacy must be the formulation and publication of definite rules and regulations fixing the educational qualifications for license; the framing of rules defining the meaning of the term "approved schools of pharmacy" when contained in laws and Board rules; keeping such office records as are necessary, including statistical data for publication in their annual reports; the planning of examinations and employment of examiners.

Every citizen is entitled to know as definitely as practicable what constitutes a qualified or competent pharmacist in the eyes of the law. Every citizen who desires to engage in any lawful occupation has a right to know upon what terms he may do so. But applicants for license to practice pharmacy are, as a general rule, simply informed that they must be of a certain prescribed age, have a certain number of years' experience in a drug store, and *pass an examination* on *Materia Medica*, chemistry and pharmacy. No one is able to learn the nature and scope of that examination or what it stands for. The inevitable consequence of the absence of published, specific educational standards and direct information as to what constitutes a proper educational preparation for the examination is that cramming takes the place of education, that the candidates for license resort to the memorization of questions and answers contained in quiz com-

pends published expressly for that purpose, and that cramming schools flourish and multiply.

In some states the office force employed by the Board is amply sufficient to justify the reasonable expectation that instructive statistical tables of the age, general and special education, shop training, etc., of those licensed shall be compiled and made available.

The secretary or clerk of a Board of Pharmacy should be a competent and well-educated pharmacist. If possible, he should devote his whole time to the routine office work of the Board under its direction. Sometimes the office has been used to reward political workers, and in such cases it may well happen that the Secretary of the Board wields greater power than the Board itself. This evil is all the more intolerable in view of the fact that the druggists pay the cost.

There are signs of decided improvement in the character of the examination questions employed by the Boards. The Board of Pharmacy of my own state used in its latest examination the set of questions in chemistry attached as an appendix to this address. Any candidate who cannot answer those questions must be set down as knowing nothing whatever of chemistry; but candidates who can answer them probably possess a working knowledge of it sufficient to satisfy the requirements. No person can possibly succeed in preparing for such an examination by mere cramming, for the answers to those questions are not to be found ready made in any book.

In conclusion I desire to ask your pardon for inflicting upon you such a lengthy address, and for assuming to utter so many criticisms and offer so much unsolicited advice. My only defense is my love for my chosen calling. I am proud to be a pharmacist and jealous of the good name of our common profession. Let us so act together that all men will respect it.

STATE BOARD OF PHARMACY OF ILLINOIS.

EXAMINATION IN CHEMISTRY.

1. What is silver nitrate test solution used for? And barium nitrate T. S.
2. What is the chemical cause of the great rise of temperature, when water is added to sulphuric acid? Write the equation representing the reaction.
3. Assuming that the molecular weight of nitric acid is 63 and the atomic weight of mercury 200, what per cent. of absolute nitric acid must be contained in a nitric acid of which 4 kilos will suffice to convert 3 kilos of mercury into mercuric nitrate? Write the chemical equation representing the reaction.
4. Explain the reactions and show by equations the method of preparing Solution of Ferric Chloride U. S. P. from iron wire.
5. If one molecule of sodium carbonate is required to saturate two molecules of hydrochloric acid, how many molecules of potassium bicarbonate are required to do it?
6. What is "Normal Sulphuric Acid V. S."? What is its strength and what is it used for?
7. Give the correct technical names of the following compounds and state the difference between them: (a) $H_2(O_2SO_2)$; (b) H_2SO_4 ; $SO_2(OH)_2$.
8. Give illustrations of univalent, bivalent and trivalent acid radicals.
9. What is the per cent. of ammonium hydroxide in a 17 per cent. solution of ammonia?
10. Calculate the percentage of absolute H_2SO_4 present in dilute sulphuric acid, 30 grams of which are neutralized by 84 Cc. of normal volumetric solution of KOH.

The address of the chairman was greeted with hearty applause.

The Chair called for action on the address, and Mr. Asher, of New Orleans, moved to receive, to take the usual course.

Mr. Schulze, of Baltimore, said he thought the suggestion of the chairman that the secretary should be made a permanent officer was an important one, and that the Section should take some definite action in regard thereto.

Mr. Hynson asked Mr. Oldberg what his view was as to whether or not his address as chairman should be referred to a committee, and Mr. Oldberg replied that he thought in the interest of the Section that would probably be the better course. Thereupon Mr. Mayo moved the appointment of a committee of three to consider the address and report at the next session, and this motion prevailed. The Chair appointed as such committee Messrs. H. P. Hynson, of Maryland; W. H. Searby, of California, and C. S. N. Hallberg, of Illinois.

Chairman Oldberg resumed the chair and called for the reading of the Secretary's report as the next order of business. Mr. England presented his report in abstract, the full text being as follows:

REPORT OF THE SECRETARY OF THE SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

Gentlemen: In order that a comprehensive report might be made of matters pertaining to pharmaceutical education and legislation for the year 1906-1907, your Secretary sent out a series of questions to all Schools of Pharmacy, Boards of Pharmacy and State Pharmaceutical Associations, as shown below, and has compiled the answers received in suitable form for ready reference. Regarding the work of the Schools and Boards of Pharmacy, much interesting information will be found in the statistics forming a part of this report.

SCHOOLS OF PHARMACY.

1. What are the entrance requirements as to age and preliminary education?
2. How much practical experience in drug stores, if any, is required for graduation?
3. What was the total attendance in your institution for the year 1906-1907?
4. What was the total number of graduates in the same year?
5. What is the total number of weeks of instruction from matriculation to graduation?
6. What is the total number of hours of obligatory attendance weekly?
7. What is the total number of hours of obligatory lecture work, of obligatory laboratory work, and of other obligatory school work, if any?

ALABAMA.

Auburn: Alabama Polytechnic Institute, Department of Pharmacy.

- a. Entrance requirements (age and preliminary education).

No report.

- b. Drug store experience required for graduation.

No report.

Mobile: University of Alabama, Department of Pharmacy.

- a. Entrance requirements (age and preliminary education).

Age 18 years; public school education; good moral character.

- b. Drug store experience required for graduation.

None.

CALIFORNIA.

Los Angeles: *Southern California University, College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Applicants for matriculation must be at least sixteen years of age, and furnish evidence of their ability to prosecute the work of the course successfully. The preliminary education must be equivalent to that required for entrance into a high school.

- b. Drug store experience required for graduation.

Four years.

San Francisco: *California College of Pharmacy, University of California.*

- a. Entrance requirements (age and preliminary education).

For the Degree of Pharmaceutical Chemist: Applicants for matriculation must be at least eighteen years old, except in the case of graduates of high schools or of accredited schools, who are admitted when seventeen years of age.

For the Degree of Bachelor of Pharmacy: Applicants for matriculation must have received a degree in Letters or Science, or have been matriculated in the University, or present a diploma from an accredited high school or other institution, whose *credentials will be accepted for entrance to the Colleges of Letters, Arts or Sciences of the University*. Those who cannot present such credentials are required to take the entrance examinations at Berkeley.

- b. Drug store experience required for graduation.

None.

San Francisco: *College of Physicians and Surgeons of San Francisco.*

- a. Entrance requirements (age and preliminary education).

Age 18 years; two years of high school or its equivalent.

- b. Drug store experience required for graduation.

For the degree of Pharmaceutical Chemist no practical experience is required. For the degree of Doctor of Pharmacy three years of practical experience prior to matriculation.

DISTRICT OF COLUMBIA.

Washington: *George Washington University, National College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Seventeen years of age, one year of high school work.

- b. Drug store experience required for graduation.

None.

Washington: *Howard University, Pharmaceutic College.*

- a. Entrance requirements (age and preliminary education).

Not less than seventeen years old. One year high school work or equivalent.

- b. Drug store experience required for graduation.

Four years.

. FLORIDA.

Jacksonville: *Florida College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

No report.

- b. Drug store experience required for graduation.

No report.

GEORGIA.

Athens: University of Georgia, School of Pharmacy.

a. Entrance requirements (age and preliminary education).

"The applicant must be not less than eighteen years of age, and must have been successfully vaccinated."

The applicant should present a certificate from an "accredited school," or stand an examination in the following branches:

English.....	3 units.
History.....	1 unit.
Mathematics.....	2 units.
Latin.....	1 unit.
Science.....	1 unit.
Total.....	8 units.

Until 1907, students may make up as many as three of the above units after admission to the School of Pharmacy. The above units mean only such an amount of education as may be obtained from the usual course of study in the State schools.

b. Drug store experience required for graduation.

None required, some preferred.

Atlanta: Atlanta College of Pharmacy.

a. Entrance requirements (age and preliminary education).

Eighteen years of age, and a good common school education equivalent to the first grade of a high school.

b. Drug store experience required for graduation.

Two years either in a store or in our free dispensary.

Atlanta: Southern College of Pharmacy.

a. Entrance requirements (age and preliminary education).

Common school education. Certificate of moral character. Not less than 18 years of age.

b. Drug store experience required for graduation.

Candidate must have filled not less than 2,000 physicians' prescriptions in a drug store.

Macon: Mercer University, School of Pharmacy.

a. Entrance requirements (age and preliminary education).

Must hold certificate from high school or be graduates of recognized colleges, or stand an examination in Latin, mathematics, English, grammar, etc. No age is mentioned in college, but student must be seventeen years at least.

b. Drug store experience required for graduation.

One year is urged, though none is required.

ILLINOIS.

Chicago: Illinois Medical College, Department of Pharmacy.

a. Entrance requirements (age and preliminary education.)

No report.

b. Drug store experience required for graduation.

No report.

Chicago: Northwestern University, School of Pharmacy.

a. Entrance requirements (age and preliminary education.)

For the degree of Graduate in Pharmacy: Age 17 years, one year of high school work, or its full educational equivalent.

For the degree of Pharmaceutical Chemist: Age 17 years, and two years of high school work.

b. Drug store experience required for graduation.

None.

Chicago: *University of Illinois, School of Pharmacy, Chicago College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years of age. Grammar school education (8th grade).

b. Drug store experience required for graduation.

Four years, from which the time spent at college is deducted.

INDIANA.

Angola: *Tri-State College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Entrance requirements fixed by "Rulings of the Indiana State Board of Pharmacy," to which we conform in every particular.

b. Drug store experience required for graduation.

None.

Indianapolis: *Winona School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age, 16 years, and one year at high school, or its equivalent.

b. Drug store experience required for graduation.

None.

La Fayette: *Purdue University, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No requirements as to age. One year in a commissioned high school; or an equivalent in some other school, or an examination covering the same studies.

b. Drug store experience required for graduation.

None.

Notre Dame: *Notre Dame University, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

For the two-year program: 18 years, and a certificate of admission to the second year of a high school or an equivalent examination. For the three-year program: Certificate of credit of two years in a high school of reputable standing, or an equivalent examination.

b. Drug store experience required for graduation.

None.

● Valparaiso: *Valparaiso University, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years of age, two years of high school work or equivalent.

b. Drug store experience required for graduation.

None.

IOWA.

Des Moines: *Highland Park College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No report.

b. Drug store experience required by graduation.

No report.

Iowa City: *University of Iowa, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education.)

Entrance requirements. Completion of second year in a high school, and evidence of good moral character.

b. Drug store experience required for graduation.

None.

Keokuk: *Keokuk College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Creditable certificates of good moral character, signed by at least one druggist and one physician in good standing in the state from which the applicant comes, and a diploma or certificate of graduation from a grammar school, evidence of having passed the matriculation examination of a recognized literary scientific college, or a certificate or successful examination by the faculty of any reputable university, college or high school, or by the state superintendent of public instruction in the following branches: English, Grammar, Arithmetic, Elementary Physics, United States History, Geography.

b. Drug store experience required for graduation.

None.

KANSAS.

Lawrence: *University of Kansas, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No statement of age required. High school preparation and in addition one year of Latin and one year of Physics, or, practically, one year of high school training.

b. Drug store experience required for graduation.

None.

KENTUCKY.

Louisville: *Louisville College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years of age. One year in a high school.

b. Drug store experience required for graduation.

Four years.

LOUISIANA.

New Orleans: *New Orleans College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

White, of good moral character, and at least seventeen years old. Candidates for admission to the Junior Class, who are *bona fide* legal residents of Alabama, Arkansas, Indian Territory, Louisiana, Mississippi, Texas, Arizona, Colorado, Idaho, Nevada, New Mexico, Utah, Wyoming and Missouri, must pass an entrance examination in the elements of English education, including writing, spelling, arithmetic, inclusive of decimals. A certificate showing completion of a grammar school course, will be accepted instead of examination. Matriculants from other states will be required, before being allowed to enter, to furnish to the Dean evidence of having completed satisfactorily one year of work in an accredited high school or its equivalent.

b. Drug store experience required for graduation.

Four years.

New Orleans: *Tulane University of Louisiana, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No age requirement for entrance. Must present certificate of good moral character, and evidence of preliminary education equal to a high school education.

b. Drug store experience required for graduation.

Two years. Must submit to the dean a satisfactory certificate of at least two years' practical experience under the instruction of a competent pharmacist. Time actually spent in the pharmaceutical laboratory will be credited as experience.

MAINE.

Orono: *University of Maine, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No requirement as to age. The entrance requirements for the *Two-year Course* are a knowledge of the following branches: Descriptive geography, arithmetic, English grammar, physiology, United States history and algebra through equations of the first degree.

For the *Four-year Course*, the entrance requirements are the regular 26 points as for the other B. S. course of the university.

b. Drug store experience required for graduation.

None.

MARYLAND.

Baltimore: *University of Maryland, Department of Pharmacy (Maryland College of Pharmacy).*

a. Entrance requirements (age and preliminary education).

Seventeen years of age and one year's work in an approved high school, or its equivalent.

b. Drug store experience required for graduation.

None.

MASSACHUSETTS.

Boston: *Massachusetts College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years, and one year in a standard high school or its equivalent.

b. Drug store experience required for graduation.

Four years.

MICHIGAN.

Ann Arbor: *University of Michigan, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Sixteen years old, and a graduate of a good high school or its equivalent.

b. Drug store experience required for graduation.

None.

Big Rapids: *Ferris Institute, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

None.

b. Drug store experience required for graduation.

None.

Detroit: *Michigan College of Medicine and Surgery, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No report.

b. Drug store experience required for graduation.

No report.

MINNESOTA.

Minneapolis: *Minnesota Institute of Pharmacy.*

a. Entrance requirements (age and preliminary education).

There are no age or educational requirements.

b. Drug store experience required for graduation.

No report.

Minneapolis: *University of Minnesota, College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Two-year Course.—Matriculants of the two-year course for 1906-07 are required to have certificates showing a four-year high school course, or its equivalent, in English, Algebra, Geometry, Physics and Latin, or pass an entrance examination; matriculants for 1907-1908 and 1909 require, in addition, evidence of special preparation in Latin, Greek, German, French, Spanish, English and History and various branches of higher mathematics and natural history.

Students may enter with two one-year conditions or three half-year conditions.

Matriculants for the *three-year course* beginning in 1907 are the same as those for admission to the two-year courses of 1906-07, with the exception that students may carry as conditions not more than three of the entrance subjects, among which English cannot be.

b. Drug store experience required for graduation.

None.

MISSOURI.

Kansas City: *Kansas City College of Pharmacy and Natural Sciences.*

a. Entrance requirements (age and preliminary education).

At least seventeen years of age, and one year in a high school or its equivalent.

b. Drug store experience required for graduation.

Four years.

St. Louis: *Barnes College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

At least sixteen years of age; must furnish evidence of ability to prosecute the course of work successfully, and must furnish evidence of having attended school, and passed examination in the elementary English branches and the rudiments of Latin. If, however, the applicant has never studied Latin, he will be required to take the Latin course provided for in this institution free of charge. The applicant must be possessed of a good moral character.

b. Drug store experience required for graduation.

Four years including the two years spent in college.

St. Louis: *St. Louis College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

An entrance examination in the common school branches, and certificates of having passed school examinations entitling the applicants to enter high schools or colleges.

b. Drug store experience required for graduation.

Four years for Ph. G., none for Ph. B.

Four years for Ph. C.

NEBRASKA.

Omaha: *Creighton College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

"No one should undertake the study of pharmacy who has not, at least, a good common school education, or such qualifications as would enable him to enter a good high

school. A complete high school course is a great advantage. Since the law of the State fixes no standard of scholarship for candidates for registration, the college authorities use their own judgment in fixing entrance requirements. Some young men who have never had the advantage of a high school course, but who are well grounded in the common branches, do as good work as do some graduates of high schools. No one who is able to do the work required will be deprived of any of the privileges of a course in pharmacy. A person who has not the qualification necessary to enter a good high school cannot be admitted. A knowledge of Latin, Physics, Botany, or Chemistry is not required for entrance. Generally speaking, no entrance examinations are demanded, but in some cases it is necessary for the candidate to take such an examination in order to determine his ability to do the work of the course. Those entering for the degree of Pharmaceutical Chemist must be graduates of a twelve grade high school and must have completed the Ph. G. course in this college or an equivalent course in some other good college of pharmacy."

b. Drug store experience required for graduation.

Two years.

NEW JERSEY.

Newark: *New Jersey College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

A certificate of graduation from a grammar school, or from a public or private high school; or passing an examination before us in arithmetic, spelling, writing, general history and geography; also, a certificate of preceptor is required.

b. Drug store experience required for graduation.

Four years.

NEW YORK.

Albany: *Union University, Department of Pharmacy. Albany College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age seventeen years, and a pharmacy student's certificate issued by the New York State Educational Department, which represents one year's work in an accredited high school, or its equivalent.

b. Drug store experience required for graduation.

None.

Brooklyn: *Brooklyn College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age 17 years, and a Pharmacy Student's Certificate.

b. Drug store experience required for graduation.

None.

Buffalo: *Buffalo College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age 17 years; satisfactory evidence of good moral character, and a Pharmacy Student's Certificate.

b. Drug store experience required for graduation.

None.

New York: *Columbia University, Dept. of Pharmacy (College of Pharmacy of the City of New York).*

a. Entrance requirements (age and preliminary education).

Age 17 years, and a Pharmacy Student's Certificate.

b. Drug store experience required for graduation.

None.

NORTH CAROLINA.

Chapel Hill: *University of North Carolina, Dept. of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age 17 years, and high school education.

b. Drug store experience required for graduation.

Four years.

Raleigh: *Shaw University (Leonard College of Pharmacy).*

a. Entrance requirements (age and preliminary education).

No report.

b. Drug store experience required for graduation.

No report.

NORTH DAKOTA.

Fargo: *North Dakota Agricultural College, Dept. of Pharmacy.*

a. Entrance requirements (age and preliminary education).

For the two-year course: At least fifteen years of age, and completion of first year in a high school or its equivalent.

The requirements *for the four-year course* in pharmaceutical chemistry are the same as to age and for admission to the general science courses in this and other leading institutions. The actual requirements in pharmacy and underlying subjects are the same as in the two-years' course. In addition to this there is required the same amount of work in cultural subjects as is found in the general science course.

b. Drug store experience required for graduation.

None.

OHIO.

Ada: *Ohio Northern University, College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Our requirements are 17 years of age, and "first year in a standard high school or its equivalent" for the Ph. G. degree. For the Phar. D. degree, the student must have a diploma from a high school and four years' practical experience before entering.

b. Drug store experience required for graduation.

None.

Cincinnati: *Cincinnati College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No report.

b. Drug store experience required for graduation.

No report.

Cleveland: *Cleveland School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years of age and a certificate showing the completion of one year of a good high school course, preferably in the following subjects: algebra, Latin and natural science, such as zoölogy and physical geography.

b. Drug store experience required for graduation.

None.

Columbus: *Ohio State University, College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age, 17 years. Preliminary education: For short course, not less than one year of standard high school, first grade. For long course, graduation from standard high school giving four years' instruction.

b. Drug store experience required for graduation.

None.

Columbus: Starling Ohio Medical University, College of Pharmacy.

- a. Entrance requirements (age and preliminary education).

"A common school education or the equivalent thereof, which shall include one year in a high school of first grade (Ohio), or an academy, legally constituted, providing a course of study of not less than four years." The minimum equivalent must embrace one year of instruction in each of the following branches, Algebra, English, Natural Science and History (United States or general history).

- b. Drug store experience required for graduation.

No experience is required for graduation. Four years are required by the Ohio Pharmacy Board to obtain a certificate for registered pharmacist.

Scio: Scio College of Pharmacy.

- a. Entrance requirements (age and preliminary education).

Seventeen years of age. One year in high school for Ph. G., or Ph. C. High school graduation for Pharm. D.

- b. Drug store experience required for graduation.

None.

Toledo: Toledo College of Pharmacy.

- a. Entrance requirements (age and preliminary education).

Seventeen years of age, and a common school education, or its equivalent, which shall include one year in a high school.

- b. Drug store experience required for graduation.

None.

OKLAHOMA.

Norman: University of Oklahoma, College of Pharmacy.

- a. Entrance requirements (age and preliminary education).

Sixteen years of age. Instruction in English (2 units), history and civics (1 unit), algebra (1 unit), botany (1 unit), physics (1 unit), and Latin (1 unit).

- b. Drug store experience required for graduation.

None.

OREGON.

Corvallis: Oregon Agricultural College, Department of Pharmacy.

- a. Entrance requirements (age and preliminary education).

No report.

- b. Drug store experience required for graduation.

No report.

PENNSYLVANIA.

Philadelphia: Medico-Chirurgical Society of Philadelphia, Department of Pharmacy.

- a. Entrance requirements (age and preliminary education).

One year of completed high school work, or equivalent education, certified by an authorized official of the State Department of Education.

- b. Drug store experience required for graduation.

Four years.

Philadelphia: Philadelphia College of Pharmacy.

- a. Entrance requirements (age and preliminary education).

Eighteen years of age and one year in a graded high school or its equivalent.

- b. Drug store experience required for graduation.

Four years or its equivalent.

Philadelphia: *The Temple College, Department of Pharmacy.*

- a. Entrance requirements (age and preliminary education).
Age 17, and one year in a recognized high school or its equivalent.
- b. Drug store experience required for graduation.
Four years.

Pittsburg: *Pittsburg College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).
Age 17, and one year of education in a standard high school, or its equivalent.
- b. Drug store experience required for graduation.
Four years.

RHODE ISLAND.

Providence: *Rhode Island College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).
No specific age. A certificate from a high school or reputable preparatory school, or examination.
- b. Drug store experience required for graduation.
Three years.

SOUTH CAROLINA.

Charleston: *Medical College of the State of South Carolina, Department of Pharmacy.*

- a. Entrance requirements (age and preliminary education).
Age 21. A preliminary education satisfactory to the faculty.
- b. Drug store experience required for graduation.
Experience in Roper Hospital Dispensary.

SOUTH DAKOTA.

Brookings: *State Agricultural College of South Dakota, Department of Pharmacy.*

- a. Entrance requirements (age and preliminary education).
No age requirement. Scholarship requirement: two years in high school work, including one year of physics and chemistry.
- b. Drug store experience required for graduation.
None.

TENNESSEE.

Knoxville: *University of Tennessee, School of Pharmacy.*

- a. Entrance requirements (age and preliminary education).
Two courses of instruction are offered: one, extending over two years, leads to the degree of Pharmaceutical Chemist (Ph. C.); and the other, extending over four years, leads to the degree of Bachelor of Science (B. S.).

The requirements for admission to the two-year course are a knowledge of English, grammar, physical geography (or physics, or geology, or agriculture), history of the United States, algebra to quadratics, and two books of plane geometry. For persons who have some knowledge of the drug business, or who are more than 21 years of age, these requirements may be modified.

The requirements for admission to the four-year course are the same as those for the scientific and engineering courses. Students over 21 years of age will be admitted as specials, and may later become regular, and graduate by fulfilling all the requirements.

- b. Drug store experience required for graduation.
None.

Nashville: *Vanderbilt University, Department of Pharmacy.*

- a. Entrance requirements (age and preliminary education).
Students of this school who have passed in all the subjects of the junior year with not

more than two conditions are admitted as regular students. (Students are said to be conditioned on a subject when the grade is between forty-five and sixty per cent.).

Applicants who bring certificates of having passed in the studies of the junior year in any School of Pharmacy whose requirements for that year are, in opinion of this faculty, equivalent to those of this school.

Applicants who have received the degree of B. S. from any institution of learning of good standing, subject to the approval of the faculty.

Applicants with none of the above credentials are required to stand an examination in English and arithmetic, and three other subjects selected from the following list. The relative values of the subjects are indicated by the figures in parentheses:

English (4), Arithmetic (4), Algebra (10 quadratics) (2), Elementary Latin (2), Plane Geometry (2), United States History (2), American Literature (2), Physical Geography (2), Elementary Physics (2), Physiology (2), Botany (2), Chemistry (2), a Modern Language (2).

Those who pass on subjects with an aggregate value of ten (10) are admitted, but will not be allowed to enter upon the work of the second term until the deficiency is made up.

On presenting certificates for admission prescribed above, or on passing examination in English and arithmetic, applicants are allowed to enter as irregular students and pursue such studies as they may select, provided that the faculty are satisfied of their honesty of purpose and consider them prepared to take the subject selected. This abatement in educational qualifications is made for the benefit of men of experience in pharmacy who are desirous of making up, as far as possible, deficiencies in scientific training.

b. Drug store experience required for graduation.

None.

Nashville: *Walden University, McHarry Pharmaceutical College.*

a. Entrance requirements (age and preliminary education).

A good English education and an elementary knowledge of Latin.

b. Drug store experience required for graduation.

None.

Sewanee: *University of the South, Pharmacy Department.*

a. Entrance requirements (age and preliminary education).

Seventeen years of age. Must possess a recommendation from two physicians, attesting his fitness to enter upon the study, and the education required of a first grade teacher in public schools, or two years' high school work.

b. Drug store experience required for graduation.

Two years besides laboratory work while in the college.

TEXAS.

Dallas: *Baylor University, College of Medicine and Pharmacy.*

a. Entrance requirements (age and preliminary education).

No report.

b. Drug store experience required for graduation.

No report.

Galveston: *University of Texas, School of Pharmacy.*

Entrance requirements (age and preliminary education).

To be at least 17 years old and of under 21; to present written consent of parents or guardian.

(a) Candidates are admitted without examination on presentation of (1) first grade teacher's certificate, (2) graduates of high school of Texas affiliated with University, (3) students who have been admitted to University of Texas, (4) to collegiate department of agriculture and mechanical college of Texas. (5) graduates of normal schools, (6) graduates of colleges in and outside of Texas whose curriculum corresponds to at least high school.

(b) Others must stand examination:

Mathematics—Higher Arithmetic complete; Algebra through quadratics; Plane Geometry.

History—History of Texas; History of United States; Myer's Outlines of General History.

Geography—United States; General Geography; Physical Geography.

English—Candidate is required to write an essay of some 300 words on a subject assigned. He is graded in spelling, punctuation and grammar.

(c) Certificate of good moral character from two well-known and prominent men of his town. (Doctors, clergymen, judges, druggists.)

b. Drug store experience required for graduation.

None.

Texarkana: *Gate City Medical College, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age 21 years. First grade teacher's certificate or equivalent.

b. Drug store experience required for graduation.

Two years.

VIRGINIA.

Richmond: *University College of Medicine, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years of age. Good moral character. The completion of the common school course and, in addition, at least one year of high school studies.

b. Drug store experience required for graduation.

Four years for the degree of Ph. G., including time spent in college. None for the degree of Ph. B.

Richmond: *Virginia School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No report.

b. Drug store experience required for graduation.

No report.

WASHINGTON.

Pullman: *State College of Washington, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

At least 16 years. For a two-years' course the applicant for admission must have completed the eight grades of the public schools. He must also present 16 semesters' credits from the following list, of high school subjects, one of which must be Elementary Latin: 3 credits in Algebra, 2 in Geometry, 1 in Higher Arithmetic, 4 in English, 4 in Latin, 2 in German, 2 in French, 1 in Physical Geography, 1 in Physiology, 1 in Chemistry, 1 in Entomology, 2 in Horticulture, 2 in Agriculture, 2 in Physics, 1 in Wood-work, 1 in Drawing, 1 in U. S. History, 1 in Civics, 1 in English History, 2 in General History, 2 in Book-keeping. A semester is $4\frac{1}{2}$ months' work in one subject, one hour recitation period.

We require the completion of four years' high school work for entrance to the *four-year course*, and graduate with the degree of B. S. in Pharmacy.

b. Drug store experience required for graduation.

None.

Seattle: *University of Washington, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age 16 for all *candidates for degrees*, and graduation from an accredited high school (4 years).

"*Special students* who, by examination, can show themselves capable to carry the course may enter if over 19 years of age."

b. Drug store experience required for graduation.

None.

WISCONSIN.

Madison: *University of Wisconsin, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Graduation from a high school, or age 18 years, and 1 year in a standard high school, the intermediate time having been spent in a drug store.

b. Drug store experience required for graduation.

None.

PHILLIPPINE ISLANDS.

Manila: *University of St. Thomas, Pharmaceutical Faculty.*

a. Entrance requirements (age and preliminary education).

Fifteen years of age. It is necessary to have a degree of A. B. or a certificate showing that the applicant has passed such examinations as are required for the degree of A. B.

b. Drug store experience required for graduation.

Two years of practical experience in a drug store.

CANADA.

Montreal: *Laval University, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

A thorough education obtained in a classical college, or a satisfactory examination in French, English, Latin, mathematics, history and geography.

Students who have passed the preliminary examination of the Pharmaceutical Association of this province, which comprises the above subjects, are admitted on producing their certificates.

Students incapable of answering to above requirements are admitted to follow the courses, but cannot compete for the diploma of the school. Instruction is given in French.

b. Drug store experience required for graduation.

Two years.

Montreal: *Montreal College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No report.

b. Drug store experience required for graduation.

No report.

Toronto: *Ontario College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Diploma not granted until 21 years of age, but must have matriculation for University prior to commencing apprenticeship.

b. Drug store experience required for graduation.

Four years prior to entering the College, the Junior term of College counting as a part of the four years' apprenticeship.

Winnipeg, Manitoba: *Manitoba College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

A matriculant must present a Manitoba third class, non-professional teachers' certificate or something higher. This certificate is given on passing a satisfactory examination on courses of study in intermediate and high schools. It ranks somewhat below the full university matriculation, but many of our students possess standing higher than the third class non-professional. Age 21 is demanded for graduation.

b. Drug store experience required for graduation.

Four years.

STATISTICS OF SCHOOLS OF PHARMACY.

Total Hours of Obligatory Work.

Total Attendance 1906-1907.	Total number of Graduates 1906-1907.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work, Weekly.	a. Lecture.*	b. Laboratory.	c. Other.
No report.						
13	5		48			
ALABAMA: <i>Alabama Polytechnic Institute; Department of Pharmacy.</i>						
<i>Medical College of Alabama; Department of Pharmacy.</i>						
51	Phar. D. 1 Ph. C. 26 }	27.	Phar. D. 96 Ph. C. 64	Ph. B. 724 Ph. C. 704	Ph. B. 1680 Ph. C. 832	
10	1		64			
<i>College of Physicians and Surgeons of San Francisco; Department of Pharmacy.</i>						
			24	928	608	
<i>Southern California University; College of Pharmacy.</i>						
No report.	6		52	524	724	
74	15		96	542	735	
DISTRICT OF COLUMBIA: <i>George Washington University; National College of Pharmacy.</i>						
49	Phar. D. 3 Phar. G. 8		90	800	1000	
<i>Howard University Pharmaceutical College.</i>						
9	1		No report.	No report.	No report.	
6	—		72	762	783	
FLORIDA:— <i>Florida College of Pharmacy.</i>						
<i>No report.</i>						
GEORGIA:— <i>University of Georgia; School of Pharmacy.†</i>						
144	65		52	741	730	104
<i>Atlanta College of Pharmacy.</i>						
22	10		64	785	815	
<i>Mercer University; School of Pharmacy.</i>						
* Lecture hours include Review and Quiz hours.						
† For Junior year only.						

† For Junior year only.

* Lecture hours include Review and Quiz hours.

STATISTICS OF SCHOOLS OF PHARMACY.—Continued.

Total Hours of Obligatory Work.

Total Attendance 1906-1907. Total Number of Graduates 1906-1907. Weeks of Instruction from Matriculation to Graduation. Hours of Obligatory Work, Weekly. a. Lecture. b. Laboratory. c. Other.

Southern College of Pharmacy, Atlanta, Ga.

124 60 50 27 Lecture and Recitation 1392 392

ILLINOIS:—*University of Illinois; School of Pharmacy; Chicago College of Pharmacy.*

172 42 60 From 20 to 23 Lectures and Recitation 502 640

Illinois Medical College; Department of Pharmacy.

No report.

Northwestern University; School of Pharmacy.

170 80 Ph. G. 54 30 540 (about) 1100 (about)
Ph. C. 72 30 560 (about) 1600 (about)

INDIANA:—*Valparaiso University; Department of Pharmacy.*

90 48 72 Average 35 Lectures and Recitations 1386 1320

Notre Dame University; Department of Pharmacy.

20 3 yr. course Ph. C. 1 31 Ph. C. 1116 Ph. C. 2232
2 yr. course Ph. G. 4 Ph. G. 720 Ph. G. 1306

Purdue University; School of Pharmacy.

107 46 65 28 912 507

Tri-State College of Pharmacy.

32 16 Ph. C. 72 40 Ph. C. 1260 Ph. C. 1752
Ph. G. 52 Ph. G. 684 Ph. G. 972

Winona School of Pharmacy.

96 15 Ph. C. 72 36 Ph. C. 850 Ph. C. 1300
Ph. G. 52 Ph. G. 750 Ph. G. 832

IOWA:—*Highland Park College of Pharmacy.*

No report.

STATISTICS OF SCHOOLS OF PHARMACY—Continued.

Total Attendance 1906-1907.	Total Number of Graduates 1906-1907.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work, Weekly.	Total Hours of Obligatory Work.		
				a. Lecture.	b. Laboratory.	c. Other.
120	4	72	<i>Ferris Institute; Department of Pharmacy.</i>			
			25	Lecture and Recitation 720	1080	
94	Ph. C., 2 yrs. 18 B. S., 4 yrs. 10	2 yr. course 72 4 yr. course 144 Summer Course, 6 weeks	34	<i>University of Michigan; School of Pharmacy.</i> 720	1728	
76	19	80	40	MINNESOTA: <i>University of Minnesota; College of Pharmacy.</i> Lecture and Recitation 933	1488	
				<i>Minnesota Institute of Pharmacy.</i>		
The Minnesota Institute of Pharmacy is a private school for preparing druggists for state board examinations. There is no graduation from the school, and there are no age or educational requirements.						
64	24	64	64	MISSOURI:— <i>Kansas City College of Pharmacy and Natural Sciences.</i> Juniors 25 Seniors 25	928	
No report.	Seniors 13 Juniors 11	62		<i>Barnes College of Pharmacy.</i> Seniors 23 Juniors 22		
140	56	60	23	<i>St. Louis College of Pharmacy.</i> 550	840	
107	45	48	32	NEBRASKA:— <i>Creighton College of Pharmacy.</i> 696	840	
81	34	58	11	NEW JERSEY:— <i>New Jersey College of Pharmacy.</i> Juniors 11 Seniors 15½	580	319

STATISTICS OF SCHOOLS OF PHARMACY—Continued.

Total Attendance 1906-1907.	Total Number of Graduates 1906-1907.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work, Weekly.	Total Hours of Obligatory Work.		
				a. Lecture.	b. Laboratory.	c. Other.
71	26	54	NEW YORK:— <i>Union University</i> ; <i>Department of Pharmacy (Albany College of Pharmacy)</i> .			
			Juniors 19	Lecture and Recitation 513	486	
			Seniors 18			
161	81	64	<i>Brooklyn College of Pharmacy</i> .			
			15	Lecture and Recitation 550	410	
99	35	52	<i>Buffalo College of Pharmacy</i> .			
			20	488	537	
252	Ph. G. 90 Ph. C. 8 Phar. D. 29	56	<i>Columbia University</i> ; <i>Department of Pharmacy (College of Pharmacy of the City of New York)</i> .			
			20	700	420	
30	5	70	NORTH CAROLINA:— <i>University of North Carolina</i> ; <i>Department of Pharmacy</i> .			
			Juniors 14	614	660	
			Seniors 27			
31	6	96	<i>Shaw University (Leonard College of Pharmacy)</i> .			
			15	No report.	No report.	
48	5	72	NORTH DAKOTA:— <i>North Dakota Agricultural College</i> ; <i>Department of Pharmacy</i> .			
			30	Lecture and Recitation 1440	720	
No report.			OHIO:— <i>Cincinnati College of Pharmacy</i> .			
			<i>Cleveland School of Pharmacy</i> .			
67	13	90	1st year 11	Lecture and Recitation 570	585	
			2d year 14			
			3d year 13½			
12	2	68	<i>Starling Ohio Medical University</i> ; <i>Department of Pharmacy</i> .			
			21	432	816	

STATISTICS OF SCHOOLS OF PHARMACY—Continued.

Total Hours of Obligatory Work.

Total Attendance 1906-1907.	Total Number of Graduates 1906-1907.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work, Weekly.	a. Lecture.	b. Laboratory.	c. Other.
60	14	52	OHIO:— <i>Ohio Northern University; College of Pharmacy.</i> About 15 About 390	About 620	130	
75	14	Short Course 72 Long Course 144	<i>Ohio State University; College of Pharmacy.</i> 28 Short Course 921 Long Course 1621	Short Course 1095 Long Course 2060		
72	28	Ph. G. 56 Ph. C. 76 Phar. D. 114	<i>Scio College of Pharmacy.</i> 35 Ph. G. 800 Ph. C. 1100 Phar. D. 1800	Ph. G. 1000 Ph. C. 1400 Phar. D. 2000		
25	10	56	<i>Toledo College of Pharmacy.</i> 35 840	1120		
43	12	72	OKLAHOMA:— <i>University of Oklahoma; School of Pharmacy.</i> 51 1536	3072		
105	23	144	OREGON:— <i>Oregon Agricultural College; Department of Pharmacy.</i> 22 1045	2123		<i>Physical Training.</i> 288
173	52	68	PENNSYLVANIA:— <i>Medico Chirurgical College of Philadelphia; Department of Pharmacy.</i> 23½ 680	900		
414	106	79	<i>Philadelphia College of Pharmacy.</i> 17 830	455		
200	63	Ph. G. 60 Phar. D. 90	<i>Pittsburg College of Pharmacy.</i> Ph. G. Junior 18½ Ph. G. Senior 20 Phar. D. 20	Ph. G. 450 Phar. D. 1080		
18	8	Day Course 74 Evening Course 111	<i>The Temple College; Department of Pharmacy.</i> Daily Course 18 Evening Course 12	730		

STATISTICS OF SCHOOLS OF PHARMACY—Continued.				Total Hours of Obligatory Work.		
Total Attendance 1906-1907.	Total Number of Graduates 1906-1907.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work, Weekly.	a. Lecture.	b. Laboratory.	c. Other.
RHODE ISLAND:— <i>Rhode Island College of Pharmacy.</i>						
74	9	Ph. G. 72 Ph. C. 108 Phar. D. 144 M. S. 144	14	432	576	
52	21	SOUTH CAROLINA:— <i>Medical College of the State of South Carolina; Department of Pharmacy.</i>				
		56	18	About 250	About 350	
20	4	SOUTH DAKOTA:— <i>South Dakota State College of Agriculture and Mechanic Arts; Department of Pharmacy.</i>				
		73	About 24	Lecture and Recitation 864	864	
22	10	TENNESSEE:— <i>University of the South; Pharmacy Department.</i>				
		60	21	660	680	120
44	8	<i>Walden University; Meharry Pharmaceutical College.</i>				
		78	25	Lecture and Recitation 780	1170	
14	3	<i>University of Tennessee; School of Pharmacy.</i>				
		74	21	666	1036	
53	9	<i>Vanderbilt University; Department of Pharmacy.</i>				
		72	27	About 825	About 1200	
No report		TEXAS:— <i>Baylor University; College of Medicine and Pharmacy.</i>				
55	19	<i>University of Texas; School of Pharmacy.</i>				
		41	Junior 40 Senior 38	Junior 339 Senior 365	Junior 1107 Senior 1146	
66	26	<i>Gate City Medical College; School of Pharmacy.</i>				
		60	24	720	600	120
49	11	VIRGINIA:— <i>University College of Medicine; Department of Pharmacy.</i>				
		62	Junior 25 Senior 25	Lecture and Recitation 560	840	
No report		<i>Virginia School of Pharmacy.</i>				

BOARDS OF PHARMACY.

1. Please report :

(a) The number of applicants for registration as pharmacists, assistants and apprentices, respectively, in your state in 1906.

(b) The number registered and licensed in each class.

(c) The number examined and the number licensed without examination as graduates of pharmacy.

2. What was the total number of registered and licensed pharmacists (if licensed druggists constitute a separate class from the registered pharmacists, under your law, state the number), registered assistant pharmacists, and registered apprentices in your state on December 31, 1906, or at the date nearest December 31, 1906, on which your records show these totals?

3. What is the total number of drug stores in your state?

STATISTICS OF BOARDS OF PHARMACY—Continued.

Applicants in 1906.		Registered in 1906.		Total Number Examined.	Registered Without Examination.	Total Number Registered 12-31-06. Pharmacists.	Total Number Registered 12-31-06. Assistants.	Total Number of Druggists
Pharmacists.	Assistants.	Pharmacists.	Assistants.					
INDIAN TERRITORY.								
	40	125	10	135				
				INDIANA.				
196	141	176	127	332	3	Both 341		No data.
				IOWA.				
No report.				KANSAS.				
168	19	85	6	No report.	19	1673	38	No report.
				KENTUCKY.				
None.	None.	49	None.	131	None.	1754	None.	800
				LOUISIANA.				
No report.		No report.		No report.	None.	1345	426	Not known.
Apprentice Applicants, 78		Apprentice cert. reg., 78						
				MAINE.				
99	3	24	1	No report.	No report.	786	63	500
				MARYLAND.				
57	26	27	19	84	None.	Both 1291		600
				MASSACHUSETTS.				
341	None.	100	None.	327	None.	4659	None.	Not known.
				MICHIGAN.				
No report.								

STATISTICS OF BOARDS OF PHARMACY—Continued.

Applicants in 1906.		Registered in 1906.		Total Number Examined.	Registered Without Examination.	Total Number Registered Pharmacists.	Total Number Registered 12-30-06. Assistants.	Total Number of Druggists.
Pharmacists.	Assistants.	Pharmacists.	Assistants.					
Both 168		70	32	NORTH DAKOTA.	18	554	145	Not known.
				168				
		125	72	OHIO.	None.			2400
				402				
230	38	172	28	OKLAHOMA.	117	768	28	500
				138				
No report.	No report.	No report.	No report.	OREGON.	None.	950	250	Not known.
				No report.				
93	353	56	123	PENNSYLVANIA.	None.	No report.	No report.	About 3200.
				446				
3	44	1	19	RHODE ISLAND.	None.	328	183	811
				47				
No report.				SOUTH CAROLINA.				
No report.				SOUTH DAKOTA.				
				TENNESSEE.	None.	1148	126	388
74	49	32	38	119				
				TEXAS.				
No report.				UTAH.				
No report.								

STATISTICS OF BOARDS OF PHARMACY—*Concluded.*

Applicants in 1906.		Registered in 1906.		Total Number Examined.	Registered Without Examination.	Total Number Registered, 12-31-06. Pharmacists. Assistants.	Total Number of Druggists.
Pharmacists.	Assistants.	Pharmacists.	Assistants.				
43	None.	17	None.	VERMONT. 40	None.	362	175
107	21	31	19	VIRGINIA. 128	None.	808	Not known.
152		92	3	WASHINGTON.*			
No report.	None.	60		WEST VIRGINIA.	24	1573	About 350
No report.				WISCONSIN.			
No report.				WYOMING.			

*1906-07.

STATE ASSOCIATIONS.

The following questions were asked :

"What new legislation was proposed, whether passed or not, affecting pharmacy, in your State, during the year from January 1, 1906, to December 31, 1906, that is, laws concerning the registration and license of pharmacists and druggists and their assistants and apprentices, or the sale of poisons, liquors, alcoholic preparations, proprietary preparations, patent medicines, or any other articles used as medicines or containing medicinal substances and customarily sold by druggists? Please send a copy of any such laws, or if this be impracticable, give brief synopsis of them.

Where legislative action was taken, the results are given below, and embrace, in some cases, laws enacted in 1907.

ALABAMA.

Legislature now (July 27, 1907) in session. A new pharmacy law, prepared by a committee from the Alabama Pharmaceutical Association, and retaining most of the changes wished, was passed. It goes into effect January 1, 1908. The principal features make *all* applicants for State certificates to practice pharmacy stand the examination. Heretofore, physicians who held medical certificates, received drug licenses without examination. The Board of Pharmacy has still the right to recognize certain colleges of pharmacy and to interchange certificates with other States. The new law requires one year of actual experience before examination. The old law required no experience. The Board of Pharmacy is placed under the control of the State Association so far as appointments to memberships by the Governor are concerned; heretofore, the latter appointed, regardless of the recommendations by the State Association. Again, the poison and narcotic law forbids the sale of morphine and cocaine, except on the prescription of physicians, and then not more than five grains may be prescribed at any one time to the same person. The proposed food and drug bills are still on the calendar, and as the legislature will probably adjourn in two weeks, their passage is doubtful. The bills introduced follow, in the main, the national act.

ARKANSAS.

Law enacted essentially a copy of the national food and drugs act. It will go into effect January 1, 1908.

DISTRICT OF COLUMBIA.

New pharmacy law beginning May 7, 1906. Requires examination of all applicants.

FLORIDA.

Pure food and drug law similar to federal law enacted, the enforcement of the law being placed in the hands of the State Commissioner of Agriculture. To go into effect January 1, 1908.

GEORGIA.

No new laws passed. On August 1, 1907, the food and drug law, passed in 1906, and similar to the one enacted by the U. S. Government, became effective. Under control of Commissioner of Agriculture.

ILLINOIS.

State law amended in certain details by Act approved June 3, 1907, in force July 1, 1907. The Illinois Pharmaceutical Association is in favor of observing the workings of the federal law before recommending state legislation based upon it.

INDIANA.

Amendment to pharmacy law adopted. Copy not sent.

INDIAN TERRITORY.

The existing law was passed by Congress for Indian Territory, April 28, 1904, and Congress only can amend it. "When statehood comes to us," writes Secretary H. D. Kniseley of the Board of Pharmacy, "we will do the business."

IOWA.

Bills were passed to prevent the indiscriminate distribution of samples of medicine; to revise the poison schedule of the state law; and to prevent the adulteration, misbranding and imitation of drugs along the lines of the drug portions of the national food and drug law. The enforcement of the pharmacy laws is vested in three Pharmacy Commissioners.

KANSAS.

A law similar to the federal food and drug law, but exempting physicians' prescriptions, was passed by the legislature. The process of the federal law permitting the sale of drugs differing from the U. S. and N. F., even if the standard of strength be expressed on the label, was omitted.

MASSACHUSETTS.

Bill passed imposing \$50 tax on Coca Cola.

MICHIGAN.

The pharmacy law of 1905 was amended regulating the sale of morphine and cocaine and derivatives and preparations of the same.

MINNESOTA.

A so-called 15-year registration bill for the purpose of permitting certain registrations without examinations was enacted, but its legality is now being tested by the Minnesota State Pharmaceutical Association in the state courts.

MISSOURI.

A food and drug law almost identical with the national act was passed. It does not cover physicians' prescriptions. Its enforcement is delegated to a food commission. A law was enacted, also, regulating the filling of prescriptions containing intoxicating liquors.

NEBRASKA.

Bill passed along the lines of the national food and drugs act, the law to be under the control of a food, dairy and drug commission, the Governor of the State being the commissioner, with power to appoint a deputy commissioner and other salaried officials.

NEW HAMPSHIRE.

A pure food and drug law was enacted. This is similar to the national law, there being but few changes, and those of a minor nature. Food preservatives are barred with the exception of table salt, saltpetre, cane sugar, vinegar, spices and wood smoke. Benzoate of sodium may be used to the extent of one-tenth of one per cent. in such articles of food as the State Board of Health may decide cannot be successfully marketed without it. The amount, however, must be stated on the label. The law goes into effect October 1, 1907, and the work of carrying out its provisions is placed in the hands of the State Board of Health.

Another bill was passed prohibiting the sale of adulterated ice cream. Under the provisions of this law, nothing but cream, milk, eggs, sugar and a neutral flavor can be used, and it must contain at least fourteen per cent. of butter fat. This bars out gelatin, corn starch, flour and the various so-called ice cream powders that have been so extensively used in the past.

NEW JERSEY.

Bill passed along the lines of the national food and drugs act, to take effect October 1, 1908, but, writes G. W. Parisen, Chairman of the Legislative Committee of the New Jersey Pharmaceutical Association, the law has several objectionable features which make it impracticable and dangerous to the drug trade. These are: (1) the omission of the proviso that is in the national act, permitting the sale of drugs differing in strength from the U. S. Pharmacopœia and National Formulary, if the standard of strength, quality and purity, be plainly and correctly stated on the label; (2) no provision is made for permission to sell proprietary drugs and foods on hand in the State at the time the law becomes operative: The omission of this clause means the confiscation of many thousands of dollars worth of goods now in the hands of the drug trade of the State; (3) the broad license given to physicians to dispense any drugs or medicines without regard to the quality or character; and (4) the absolute control given to the Board of Health at any time to fix a standard for a drug or food by simple resolution. Steps will be taken to secure the elimination of these objectionable features at the next session of the legislature.

NEW MEXICO.

New Mexico Pharmacy Law of February 15, 1889 amended in part by legislature. Amendments not specifically given in report sent.

NEW YORK.

The report of the Legislative Committee of the New York State Pharmaceutical Association, made by Dr. Wm. Muir, at the meeting of the Association held June 25, 1907, reviews at length the bills of interest to pharmacists that came before the New York legislature at its recent session. They were many in number, and in some instances dangerous. Thirty-two separate bills had to be dealt with, and these with amendments brought the total up to nearly a hundred. The only bill that passed the legislature in opposition to the wishes of the committee was that of Assemblyman Lupton, which adds to the list of articles that may be sold by a general store, quinine, cathartic pills, seidlitz powders, and other household remedies, and, when bearing the label of a licensed pharmacist, spirit of camphor, spirit of nitre and tincture of arnica. Defeated were such measures as the Wainwright bill to amplify the provisions of the national pure food and drugs act and constitute them a state act, with a provision giving its enforcement to the State Board of Health instead of the State Board of Pharmacy; the McCarren bill permitting the sale by department and general stores of domestic remedies and prescriptions prepared in the presence of a licensed pharmacist or druggist; the Whitney bill which would have required every druggist to place his formula upon his preparation if it contained alcohol, either for the purpose of preserving or dissolving the ingredients; a number of objectionable so-called pure food and drug bills; bills to enable certain persons to secure pharmacists' certificates without conforming to the regular requirements; the Smith bill restricting not only the sale of cocaine, but also of acetanilide and opium, and all of its preparations, and making the violation a felony.

Measures the Committee favored included an amendment to subdivision four of the pharmacy law providing for the collection of cumulative penalties in one action (which amendment was not secured); an amendment to the poison schedule in accordance with the wishes of the Association (passed); the Whitney bill making the schedule of poisons embodied in the penal code correspond to the same provisions in the public health law (passed); restricting the sale of cocaine; a modification of the drastic provisions of the Page anti-substitution bill; the Hastings bill providing that any person who holds a pharmacist's license granted by any of the old local boards of the state may exchange such license for one allowing him to practice anywhere within the State (passed).

The Committee recommended (1) that the incoming legislative committee be directed to confer with the State Board of Health and the State Department of Agriculture, with a view to preparing and securing the passage of such legislation as will bring into harmony with the national law the state statutes relating to drugs, and that the administration of the law be placed in the hands of the Board of Pharmacy; (2) that efforts be made to secure an amendment of the pharmacy law whereby the penalty for violation should be increased from \$25 to \$50; (3) the pharmacy law be amended to provide that the members of the State Board of Pharmacy shall receive for their services the sum of \$5 per day, as at present, but that the gross amount paid for such services to any one member shall not exceed the sum of \$300 in any one year.

The Page Anti-substitution bill, above referred to, is described by Merck's "Archives" (August 1907) as follows:

"The anti-substitution bill, introduced into the New York legislature by Senator Page, and providing severe penalties for the druggist who dispenses a drug other than the one prescribed or ordered, has been passed by the legislature and signed by Governor Hughes. The bill was aggressively championed by Charles Roome Parmele, of the Parmele Pharmacal Company, of New York, in the face of strong opposition. The bill reads that 'any person who in putting up any drug or medicine or food or preparation used in medical practice, or making up any prescription or filling any order for drug, medicines, food or preparation, puts any untrue label, stamp or other designation of contents upon any box, bottle or other package containing a drug, medicine, food or preparation used in medical practice, or substitutes or dispenses a different article for, or in lieu of, any article prescribed, ordered or demanded, or puts up a greater or less quantity of any ingredient specified in any such prescription, order or demand by substituting one drug for another, is guilty of a misdemeanor; provided, however, that, except in the case of physicians' prescriptions, nothing herein contained shall be deemed or construed to prevent or impair or in any manner effect the right of an apothecary, druggist, pharmacist or other person to recommend the purchase of an article other than that ordered, required or demanded, but of a similar nature, or, to sell such other article in place or in lieu of an article ordered, required or demanded, with the knowledge and consent of the purchaser.' The act becomes operative September 1, 1907."

The Health Department of the City of New York has by resolutions, added certain sections to its sanitary code that are similar to those of the federal food and drugs act.

NORTH CAROLINA.

Law similar to national food and drugs act passed. Under executive control of Commissioner of Agriculture.

NORTH DAKOTA.

New pharmacy law enacted; copy not sent.

OKLAHOMA.

Oklahoma State Pharmaceutical Association has recently appointed a committee to draft a law along the lines of the Beal Model Law, for presentation at the next meeting of the legislature. Copy of proposed law sent.

OREGON.

State law amended February 21, 1907. The amendments refer to the sale of poisons, and the licensing of itinerant venders of drugs.

PENNSYLVANIA.

Food bill passed along the lines of the food portions of the national food and drugs act. By agreement with the drug interests, the drug features of the latter law were omitted from the law. Enforcement of the law placed in the hands of the Dairy and Food Commissioner.

SOUTH DAKOTA.

The South Dakota legislature of 1907 passed a food and drug law somewhat similar to the federal act; a peddlers license law (which has since been attacked legally, but has been held valid by the State Supreme Court); an act to prevent deception in the sale of paint; a law regarding stock foods. Every package must have the formula and proportion of each ingredient—which is now before the courts. The Commissioner holds, also, that the drug law provides for a qualitative statement to be printed on each label or package of patents of every kind. This ruling will be contested. One other enactment—all pharmacists are prohibited from selling liquors of every kind in towns and cities that vote against license, except on a physician's prescription, who is required to state the disease for which it is required, and said prescription cannot be refilled. Another bill was introduced and defeated—that every pharmacist should expose his prescription case in such a manner that at all times the customers could see behind it. "Some other focal laws," writes Secretary E. C. Bent of the South Dakota Pharmaceutical Association, and South Dakota Board of Pharmacy, "were introduced affecting our interests, but I cannot now recall them."

TENNESSEE.

Bill passed April 24, 1907, to prohibit the manufacture and sale of adulterated or misbranded foods and drugs. Under the executive control of State Board of Health. Similar to the national law.

TEXAS.

State Pharmacy law enacted. It provides that the State Pharmaceutical Association may suggest candidates for board membership, to be appointed by the governor. At the convention of the Texas Pharmaceutical Association, held in Waco, June 18-20, 1907, the President, T. J. Coulson, recommended, in his address, that the Association vote at this meeting upon names to be submitted to the governor for appointment to the board of pharmacy, but it developed in the discussion that the present governor had opposed this provision of the new law, as it infringed upon his prerogatives, but, not to endanger the bill, he had signed it, with a tacit understanding with members of the Legislative Committee of the Association that no name would be sent to him officially by the Association this year. The matter was finally adjusted by amending the by-laws to provide that from 1909, and every two years thereafter, ten names be submitted by the Association to the governor for appointment on the board, and that for this year the Association simply tender its good offices to the governor. The Texas food and drug law (1907) was placed under the executive control of the Dairy and Food Commissioners.

UTAH,

Bill passed regulating the sale of narcotics and derivatives and preparations of the same. To go into effect January 1, 1908.

WASHINGTON.

Food and drug law passed. Analogous to national law. Under executive control of a State Board of Food Commissioners; to go into effect October 1, 1907. There was enacted also an act relating to the sale of intoxicating liquors.

WEST VIRGINIA.

Pure food and drug law similar to national law enacted. Goes into effect January 1, 1908. Executive control placed in the hands of the prosecuting attorney of each county.

WISCONSIN.

An amendment to the state pharmacy law was passed, giving the Board of Pharmacy the power to grant permits to dealers in general merchandise in rural districts; and to

sell certain drugs and medicines as specified by the Board, the object of the law being to place the sale of *all* drugs and medicines, whether by registered pharmacists or others, under the direct supervision of the Board of Pharmacy. Amendments were passed, also, regulating the sale of poisons and narcotics, along the lines of the so-called Chicago model anti-narcotic bill.

SCHOOLS OF PHARMACY.

The following summary of data obtained by your Secretary from Schools of Pharmacy (74 schools replied out of 80) is of interest:

Maximum number of students.....	414
Minimum number of students.....	6
Maximum number of graduates.....	127
Minimum number of graduates.....	1
Maximum weeks of instruction.....	144
Minimum weeks of instruction.....	22
Maximum hours of lecture work.....	1800
Minimum hours of lecture work.....	41
Maximum hours of laboratory work.....	2123
Minimum hours of laboratory work.....	66

It needs only a cursory examination of these figures to show that the quantity and quality of instruction given in the different pharmaceutical schools is very uneven, and that there exists a strong need for better conditions of teaching generally. Not that all the schools should be required to teach exactly the same subjects, in exactly the same way; because this would destroy all individuality, and afford no incentive for individual excellence, but that the conditions of teaching should be made reasonably uniform.

We are sometimes prone to forget that our country is a new country, and that the teaching of pharmacy in the land is of comparatively recent origin; and we become discouraged, at times, with the seeming lack of progress. But, if we compare the conditions of teaching to-day with those of a score of years ago, we find much to commend. In fact, considering all things, the development has been little short of marvelous, and relatively, greater than it has been in the teaching of medicine. Secretary N. P. Colwell, of the Council on Education, of the American Medical Association, has recently issued a statement to the press ("Pharmaceutical Era," July 11, 1907, 25; see also, Report of Council on Medical Education in "Journal of A. M. A.," 1907, 1701-1707), in which it is declared, as the result of three years' careful investigation of the subject, that: "There are 160 medical schools in the United States alone, as many or more than there are in all the countries of Europe combined. Of the 160 schools in the United States, *only about 50 per cent. are sufficiently equipped to teach modern medicine, 30 per cent. are doing poor work and need to make great improvements, while 20 per cent. are unworthy of recognition.* To secure better conditions will require two things: Endowments for medical schools, and better legislation providing state control of medical practice and licensure."

Does anyone mean to say that only 50 per cent. of the pharmacists in the United States are sufficiently equipped to practice pharmacy, as Dr. Colwell practically says with reference to physicians practicing medicine? It may be true that the conditions of pharmaceutical practice in this country are not what they should be, but it can hardly be claimed that the percentage of incompetents embraces one-half the entire pharmaceutical profession.

Well-trained pharmaceutical service is equally as important to the public as well-trained medical service. They go hand in hand, and one without the other means incompetent service to the sick.* Hence, it is just as important to the public welfare that

the pharmaceutical schools of the country receive endowments, and that the states have better control over pharmaceutical practice, as it is for medical schools to secure endowments and the states have better control over medical practice. If, in addition, the numerous pharmaceutical schools in some of the states—one state contains 7 schools—could combine their forces, and form one or two strong schools in the state, the outlook for state aid and better control would become infinitely brighter, and the work of the schools themselves would be greatly enhanced in value.

STATE ASSOCIATIONS.

Of the State and Territorial Pharmaceutical Associations, 32 reported out of 48. The reports show a most commendable degree of activity on the part of the officials and legislative committees of the associations. Without their aggressive work, the conditions of pharmaceutical practice in many states would have been seriously handicapped by ill-advised legislation; and the work was most meritorious because it was a labor of love.

Naturally with the recent enactment of the federal food and drugs act, many states have enacted similar legislation. So far as your Secretary can learn, from official and unofficial sources, this has been done by the legislatures of the following-named states. (In some instances, only fragmentary portions of the federal act have been used, and in some cases it has been made a part of the general laws):

Arkansas	New Jersey
California	North Carolina
Colorado	North Dakota
Delaware	Oregon
Florida	Pennsylvania (Food Law only)
Georgia	South Carolina
Indiana	South Dakota
Iowa	Tennessee
Kansas	Texas
Maine	Washington
Missouri	West Virginia
Nebraska	Wyoming.
New Hampshire	

The states enacting such legislation number twenty-four. In a number of the states the enactment of state laws conforming to the federal law were strongly opposed by pharmacists, not because they objected to such legislation, but because they believed that an opportunity should first be given to interpret and test the federal law before enacting similar legislation in the several states. "It may be said in this connection," reports Secretary Edward Williams, of the Wisconsin Pharmaceutical Association, "the dairy and food department of this state are very strong opponents of the guarantee clause in the federal bill, and will use every effort to have that section struck out of any pure food and drug bill which may be introduced into Wisconsin. It is their desire to make the retail dealer entirely responsible for the quality of everything he may sell."

BOARDS OF PHARMACY.

Regarding the State Boards of Pharmacy, 37 replies were received from 50 inquiries. The reports sent embrace most useful data, but they indicate very clearly that the methods of the boards in keeping the data are not uniform; and the results given are not comprehensive. As your Secretary expressed the opinion in his last report, "If there is not greater activity by the State Boards of Pharmacy generally, with reference to enforcing the section on adulteration in the State pharmacy laws, it is more than probable that their work will be generally transferred to the State Boards of Health, as has been done in Indiana and other States," and this prophecy is rapidly being fulfilled.

The Washington State Board of Pharmacy in their 1907 "Digest and Report" publish an excellent digest of court rulings in many States upon the subjects of negligence, liquor selling, selling without license, criminal prosecutions, rights to prescriptions, right of physicians to sell drugs, who shall be deemed a seller, the delivery of dangerous articles to children, the definition of a drug store, and other subjects of interest. This publication suggests the thought that, in the future, with the growth of food and drug laws in the different States, it will probably become necessary for some one to prepare a comprehensive digest of all federal and State food and drug laws with rulings and court decisions. A large amount of this work has already been done, in connection with the federal food and drugs act, but more will be necessary in the future. Not only this, but it will be found a useful means of codifying and harmonizing the many food and drug laws of the States that will soon be in existence.

Naturally with the wholesale enactment of such legislation that has recently taken place some mistakes have occurred, and these will need correction; and in their correction uniform procedures should be followed, as far as possible, by the different states.

In conclusion, it is of interest to add that the United States Internal Revenue Department has issued new regulations governing the manufacture and distribution of denatured alcohol to take effect September 1, 1907. These differ radically from those previously in force, and have been made necessary by the passage of an amendatory act of the existing law, by the United States Congress on March 2, 1907, whereby many of the restrictions contained in the previously-existing law were removed. The character of the legislation has been radically changed for the better, and the industries of this country will be greatly benefited thereby. Denatured alcohol may now be used in the manufacture of ether and chloroform, and for other definite chemical substances where said alcohol is changed into some other chemical substance and does not appear in the finished product as alcohol. The act in full is published in the "Oil, Paint and Drug Reporter" for July 29, 1907.

Respectfully submitted,

JOSEPH W. ENGLAND,

September 3, 1907.

Secretary.

On motion of Mr. Feil, of Cleveland, the report was ordered received, to take the usual course.

The Chair then called on Dr. J. N. McCormack, of Bowling Green, Ky., to address the Section as the representative of the American Medical Association, on the subject of "The Relations between Physicians and Pharmacists." Dr. McCormack was greeted with applause as he arose to speak, and addressed the Section as follows:

WHAT SHOULD BE THE RELATIONS OF PHARMACISTS AND PHYSICIANS.

BY J. N. MCCORMACK, M. D., LL. D., BOWLING GREEN, KY.

Hailing from the state which gave Lawrence Smith, Scheffer and Diehl to the pharmaceutical world, I feel it to be a distinguished honor to present myself as a fraternal delegate to this, the leading pharmaceutical organization in this country, from the American Medical Association, and to be the bearer to you of its most cordial greetings. But this does not include all of my mission; I am here in a dual capacity, with duties more important and delicate, as I understand them, than the pleasant and more or less perfunctory ones of a mere fraternal delegate. I am here by special

invitation of your Secretary to explain and give the reasons for certain criticisms of your fraternity embraced in my official report to our Association at its recent meeting in Atlantic City; in other words, as he so kindly and courteously expresses it," "for a heart-to-heart talk over matters of great interest to both vocations," upon the subject indicated in the above title.

In accepting this invitation I decided to do so in the spirit in which it was offered and to talk, and to ask you to talk in return, frankly and fearlessly of flagrant evils which have grown up in and between our professions to such an extent as not only seriously to threaten our relations with each other but to greatly endanger the well-being of the people. The proper performance of the important and delicate task I have set for myself requires a little personal history, in which I am sure you will indulge me. For twenty-nine years I have been a member, and for twenty-four years secretary and executive officer of the state board of health, which is also the state board of medical examiners, of Kentucky. During all of the years I have had direct charge of all health and medical legislation in the State, spending much of the time embraced in each session of the general assembly at the capital. For the past seven years I have been chairman of the committee on organization of the American Medical Association, and in that capacity have gone from state to state, and in many of them, from county to county, until almost the entire Union has been covered, discussing with medical and lay audiences questions involved in the great reforms upon which my profession has so earnestly entered. In the course of this work I have visited many state capitals and had opportunity to address a number of legislatures in the interest of these reforms. As a part of this work I have made a careful study of the relations and feelings of the physicians and pharmacists toward each other in every section of country, and have noted the marked change in these relations in many sections in recent years. I spent several months of last year in a similar study in some of the European countries, and it was in the light of this vast observation and experience that I reported to my Association the conclusions and opinions upon one phase of the subject only which attracted the attention of your officers and gives me the opportunity to be with you.

In this connection, speaking of that class of the proprietary people and their allies who "are undesirable citizens," and their adroit crusade against the wonderful drug reform to which the medical profession and country have been awakened, largely through lay efforts, I said:

"While these misrepresentations have done so little harm with the membership, I am convinced that they have kept many from joining the societies and have crippled our usefulness in many other ways. As one evidence of this, they have arrayed the retail druggists against us almost solidly in most states. At every capital visited I have found a strong force

of drug men working under the direction of expert lobbyists representing the National Association of Retail Druggists, backed by the proprietary interests, against the legislation proposed by the profession in the interest of pure food and drugs, with all of their expenses borne by that body. In every instance an attempt was being systematically and often successfully made to confuse the minds of legislators by the introduction of decoy bills prepared by their central bureau, but cunningly altered as to wording in the various states to hide their common origin. It was found in every instance that legislators were also literally inundated by letters and telegrams from their drug and newspaper constituents in the interest of these now fully exposed and recognized frauds. As a real friend of the pharmacists, one who has always been wedded to the prescription method of dispensing, the discovery of this almost universal ascendancy of the quack interests over this trade was a painful one. It evidently means that we have come to the parting of the ways with the druggists, and must arrange to dispense for ourselves, as is being done in other countries, unless prompt steps are taken in a comprehensive way to restore proper relations with them."

The above was by no means intended to apply to all pharmacists. A respectable minority was found in all of the States who could not be enlisted under the banner of Colonel Duple and other peripatetic philanthropists, or induced to join in their efforts to debauch and mislead legislators. You will note also that I hold a large element of our own press and people responsible for many of these abuses. This will be duly enlarged upon and emphasized later on in justice to all concerned. While these criticisms probably do not apply to any member of your great Association, they form a very small part of what must be said if the whole truth is to be told about the methods of the rank and file of the drug trade over this country. As a part of their regular every-day business, druggists of the class of which I am speaking sell to innocent men and women, and even for helpless children, who are trying to obtain relief from disease, habit-producing liquors and drugs which they cannot but know will work a ruin compared with which death would be a mercy. For the benefit of those who have been made habitues by the small and insidious doses so persistently urged as harmless before legislative committees and elsewhere, whiskey cures composed chiefly of whiskey and morphine cures almost wholly of morphine, and other things equally nefarious, known as such to all except those who will not see or hear, are advertised daily in the small and often in the large cities all over the country, over the personal guarantee and assurance of cure of those recognized as reputable pharmacists. As an evidence of the results of this business, which is impossible without the complicity of druggists, on a recent visit to the State Inebriate Asylum of Iowa, I was informed that the official records of that institution showed that over 75 per cent. of all who had ever been treated there owed their

condition to these habit-producing nostrums, in many instances the particular one bringing about their downfall being named. If time permitted, similar testimony might be furnished from other institutions and almost without limit from the experience of private practitioners, especially of the debauchment of unsuspecting women and children from this cause.

Aside from the victims of this infamy there are three factors now fully recognized as essential to its continued existence. These are, the proprietor or manufacturer, the public and religious press as advertising mediums, and the drug trade. It could not thrive for six months without the complicity of all three of these agencies. And yet, so fully has the commercial idea, the lust for wealth without regard for the methods necessary to obtain it, taken possession of our people, that a large majority of the personnel of these three classes is made up of men occupying the most exalted positions in the business, social and religious world. Now, I am one of the old-fashioned men who believe that ill-gotten wealth is always a curse, that "whatsoever a man soweth, that shall he also reap," and that this is especially true of druggists in connection with this business. Only one of the many instances within my own knowledge to prove this will be given. Of two personal friends of the highest character and standing who enjoyed a large trade in this line, and became wealthy, one buried his wife, and the other two accomplished sons respectively as morphine, whiskey and cocaine victims. In another connection, I shall attempt to show, that of the three classes named your people profit least by the nostrum business, and that the legitimate drug trade would be far better off financially without it, but what I am trying now to convince you of, is that the whole thing is morally wrong, and that, profit or no profit, you cannot afford longer to permit the great vocation you so ably represent to be a party to it, or to stand arrayed against legitimate legislation for the mitigation of this evil.

For lack of time I shall only say upon the general subject of counter-prescribing that, while it is under the condemnation of both professions as indefensible, I find it distinctly embraced in the teaching course and examinations of some of your leading colleges for the past year. It is my intention, however, to deal frankly with one phase of this question which, properly understood, is of almost national importance. I refer, of course, to the treatment of venereal diseases, "the great black plague," by druggists and their little-boy clerks. Gonorrhoea, especially, is now recognized as one of our most important and, if neglected or improperly treated at the outset, one of the most incurable of diseases, and yet my investigations convince me that in most sections of the country in from 50 to 75 per cent. of cases the primary treatment of which is taken in drug stores at the hands of those who would not seriously pretend to have any training or qualification for a work which often taxes the highest capacity of the specialist. Often this greatest of diseases is made a matter of sport, and the young man, having faith in what has been done for him, but usually

dangerous as long as the lives, marries, and immediately infects some trusting, pure woman. As to the importance of all this, it is only necessary to say that it is estimated by our best surgeons that over 50 per cent. of the operative work done for women in this country every year is due to this disease, and my investigations show that very much of this can be traced to this *phase* of drug-store practice. I am discussing this subject frankly before medical and mixed lay audiences every day, always giving the druggists an opportunity to respond, and I am insisting that this practice shall be broken up regardless of how they may feel about the other reforms proposed. Of the evils of substitution and kindred matters, I may have your permission to speak at another time.

This is only one side of the shield. The other relates to the sins of omission and commission of the medical profession in this connection, and it is not a pleasant picture. Druggists tell me in many sections that they do not get a "square deal" from their physicians, and this complaint is often confirmed by my inquiries. This is partially due to the gradual drifting apart and coincident misunderstanding of the two vocations, to which I shall refer later on, and still more to the loose and hazy teaching of pharmacology and therapeutics in most of our medical schools before the recent awakening. In consequence of this lack of training a large element of our profession became easy marks for the pleasant and plausible detail men, and through their joint efforts the shelves of the druggists and the stomachs of their patients were overloaded with preparations which recent developments have shown to be not only of doubtful but often of harmful composition. In the same way and from the same causes many physicians became dispensers of pills, tablets, triturates and other preparations of doubtful composition, short in weight, and otherwise so defective as to have little or no therapeutic value or to be entirely misleading. Probin, coming to us with a foreign mark but unknown in the country of its nativity, approved and exploited by one of our leading firms of manufacturing chemists, which was so recently exposed by the Council on Pharmacy, is only one of many instances which might be cited in this connection. In the name of honesty and decency in medical and pharmaceutical practice, and still more in the interest of afflicted humanity, for whose benefit we all exist, I insist that the continuance of such evils, as I have referred to in both professions, and all similar ones, should be made impossible.

For I contend that we, and especially the leaders of our organizations, are wholly responsible wherever quackery, incompetence or other frauds or impositions exist in either vocation, as the medical and pharmacy laws upon the statute books of every state were put there by our professions respectively. Unfortunately the people have taken only too little interest in either their enactment or enforcement. If they are so defective as to protect neither the health and lives of the people, or our good names, it

was because we did not possess the knowledge which would enable us to draw them correctly or because we were unable to secure such concert of action as would secure their passage as drawn and their enforcement afterwards. And there has been a sad lack of co-ordination between the states as to all of this legislation. There should be model bills drawn by some central body covering the several phases of the work in the true scientific as distinguished from an improper commercial spirit, which could be easily adapted to the condition and needs of any state. No less important, the public sentiment should be developed and fostered which would make the laws effective when passed.

In our profession we are making rapid advances in all of these matters. Starting seven years ago with a most pleasant system to look upon, but which was practically like creation at its dawn, "without form or void," we have built up the most coherent, powerful, harmonious medical organization which has ever existed. We have local societies in over 2,400 of the 2,830 counties in the United States, with a total membership which has grown from about 16,000 to 70,000. Small legislative, really representative and deliberative, bodies look after all matters at the state and and national meetings in a way and to an extent which was never possible before. While material interests are not neglected I am proud to be able to say that the true scientific spirit and the welfare of the people predominates in everything. As one of the results in the way of legislation, in almost every state graduation from a recognized medical college and an examination are required of every one desiring to enter upon the practice of medicine, as should be the case in pharmacy. A medical degree has not meant all that it should in the past, but this is also being reached. Within the past two years our Council on Education, the members of which are serving on it as a labor of love, has officially visited, inspected and reported upon the teaching facilities, equipment and methods of every medical school in the country. Such a report from such a source means that it is only a question of a little time until no diploma will be recognized as a basis for examination in any state which is not issued from a school maintaining a uniformly recognized standard. Of the work of the Council on Pharmacy, most of the members of which are distinguished members of this body, likewise serving gratuitously, it is not necessary that I should say much in this presence. Recognizing that the results of its labors are of incalculable value to honest medicine and pharmacy, the Council, and our great "Journal," which is its mouth-piece, have back of them our solid profession, as we believe is justly due to both the Council and the "Bulletin" of this Association not only from you but from all reputable pharmacists.

Much as has been accomplished, we recognize not only that our work is in its infancy but that the results of much of it must be very imperfect or long delayed unless we can secure the loyal, cordial co-operation of the

rank and file of your people. In the light of what has already been said, we also feel that a stage has been reached in our relations which will not be much longer endured by either side, and that we should at least try soon to reach an understanding if we are not to drift as entirely apart as has occurred in other countries. I earnestly believe that we can and ought to get together. Along all the lines I am discussing, from my standpoint, there is little room for difference of opinion. As to them we both exist primarily for a common, altruistic purpose, the relief of suffering humanity, and only secondarily for our own benefit. As is true of all the other learned professions, usefulness, honor, even a modest support may be ours, but legitimately followed, they are not gainful pursuits. If there be those who have entered our ranks with great fortunes as their incentives they cannot make their exit too soon for their own purposes or for the sake of our good name. It is this class, with the mercenary rather than scientific and humanitarian instincts, physicians and pharmacists only in name, who head our great quack institutions, and your great nostrum enterprises, and the medical journals which thrive by exploiting the latter. With the proper conception of duty the time has come when no physician can afford to prescribe and no pharmacist can afford to dispense any preparation of which he does not know the composition and purity. This means that we must get back to the Pharmacopœia and National Formulary and have at least as much care of what we furnish for the sick as the soldier does for the condition of his ammunition, and that each prescription is to be adapted to the individual case. This does not in the least interfere with the use of preparations of known composition and value, proprietary or otherwise, which can be better made in large quantities, but it will put an end forever to all secret nostrums, whether simply valueless, misleading or dangerous. Not only are we urging this kind of instruction upon our schools for the benefit of the future physician, but we are making it a prominent feature of the post-graduate course which is being put before every county society in the United States.

I feel sure that no argument is required to induce such a membership as yours to appreciate such a work, but I am here to plead with you to do much more than this—to take an active, aggressive, a leading part in it. I believe that there should be such an effective alliance, offensive and defensive, between this organization and the American Medical Association as will insure only pure drugs for the sick people of this country. This would require joint action, through committees and otherwise, in framing, passing and enforcing the necessary legislation, and, in what is even more important, as a necessary premise for all of this, such a campaign of education systematically conducted over the entire country as will give the professional and public sentiment, without which all such legislation is almost worse than useless. Aside from the moral wrong involved in the nostrum business, about which enough has been said, it should be urged

upon the rank and file of the drug trade that it has only enriched the manufacturer and has always been an unprofitable curse to most of them. Thanks to Collier's, Mr. Bok and Everybody's, the more intelligent portion of the public and a most important element of the lay and religious press are already with us, we have about finished our contest with the venal and misled medical press, and the time is most auspicious for the inauguration of such a campaign.

I am by no means sure that I am saying all of this in the best way. I fully appreciate the difficulties of my position, especially in that I have so little information as to the personal view-point of your members as to these matters. However faulty may be my presentation of the subject, and the plainness and bluntness of my speaking, I beg to assure you of the kindness of my intentions, and of the earnestness of the desire of those I represent to be in such harmony with you that we may work in hearty co-operation. We want you to help us make the Council on Pharmacy and the Section on Pharmacology and Therapeutics, or some other agencies of this kind, centers in and around which the two professions may gather for these purposes. At best the task will not be an easy one. Nearly every thing worth doing in this world is difficult. The interests against which we will contend are strongly intrenched, they have great wealth, and experience has shown that they are little troubled with scruples. Still, the spirit of reform is abroad in the land, and our cause is so just and the evils so easily exposed that, with two such professions as ours organized as they should be, and their hands joined in the work, the final result could not be a matter of doubt.

The Chairman stated that before calling on Mr. Rusby to speak on the same subject he would say that another pleasant evidence of the good-will of the medical profession towards the pharmacists was at hand in some messages sent to this Association through Mr. J. B. Bond, of Little Rock, Ark., and called on Mr. Bond to read these letters.

Mr. Bond spoke briefly, and said that it was due to the efforts of Dr. McCormack and the enthusiasm he aroused in Arkansas at the time the General Assembly was in session last year, on the subject of pure food and drugs, and the elimination of counter prescribing and patent medicines, that the Legislature of his State had passed *verbatim et literatim et punctuatim* the National Pure Food and Drug Law. He then read two letters, one from the President of the Arkansas Medical Society and one from the Little Rock and Pulaski Medical Society, extending hearty greetings to the American Pharmaceutical Association, and likewise a cordial invitation to hold the next annual meeting of the Association at Hot Springs.

The Chairman stated that the first thing on the program of topics prepared by the committee was the question, "What are the best means which the pharmacists may adopt to render their services most valuable to the medical profession and the public, and to command their confidence

and appreciation?" He said Mr. Rusby had consented to open discussion on this question, and he would now have the opportunity to do so. Mr. Rusby said his answer to this question would be brief, and he would confine himself to outlines or generalities, leaving it to others to take up the details. He then read the following paper, eliciting the applause of the members:

CO-OPERATION OF PHYSICIANS AND PHARMACISTS.

BY H. H. RUSBY, M. D.

I have been asked to reply to the questions, "What should be the attitude of pharmacists to the medical profession? How can they best co-operate with physicians to forward the movement for improvement in both professions and for better appreciation of both by the lay public?"

When pharmacists shall see that the general body of physicians are competent to diagnose disease accurately and to prescribe medicines intelligently and correctly, and that they refrain from attempting the work of the pharmacist, for which they are not fitted, they will respect the medical profession, as a pure matter of course, and will rely upon them.

When physicians shall see that the pharmaceutical profession generally is competent to perform its work, is conscientious in doing so, and refrains from attempting the work of the physician, for which it is not fitted, pharmacy will be certain to receive the support and indorsement of medicine.

When such a state of affairs shall have been attained, it will not be necessary to devise means for making the facts known to the public. The information will flow out inevitably and joyfully from both professions; so much so that it would be found impossible to devise any means for preventing it, were the attempt to be made.

The method of procedure then is most simple. It is for each profession to earnestly set about correcting its own defects, instead of devoting its chief efforts to correcting those of the other party. If it is replied that this implies the millennium, which will never come, then it may be answered that the objects of this inquiry will never be attained, for this is absolutely the only way to accomplish it. For some years past, until quite recently, the trouble has been that each profession, while giving close attention to the wrong-doing of the other, has neglected proper self-discipline. It has been too much a case of mutual retaliation for real or fancied offenses. Such a method is foredoomed to failure. To point out, complain of and, if possible, punish the offenses of the other party is both right and necessary, but its efficiency is slight as compared with the internal work of reform.

How is the work to be accomplished? Let us first admit that it is not to be accomplished, so far as pharmacy is concerned, by resorting to special devices, and by putting forth special efforts to secure credit with

the medical profession, and by keeping up an incessant talking about it. The Good Book says, "In vain doth the fowler spread his net in the sight of the birds." It does not inspire respect for one to openly seek to obtain it. There is always the suggestion of some ulterior object. Nothing can be more certain to degrade pharmacists in the eyes of physicians than to act on the assumption that they do not enjoy the respect of the latter and that some special effort must be made to secure it. Conversely, it is pretty certain that either an individual or a class will in time come to enjoy all the credit that is justly due them. If pharmacy will steadily pursue the line of duty, the medical profession will surely be compelled by circumstances to recognize and admit the fact or to be itself pilloried.

Precisely the same thing is true of physicians in their relation to the pharmacist. Nearly all of them are appallingly ignorant of some things, and some of them are appallingly ignorant of nearly all things pertaining to their profession. Let them correct their faults and the pharmacist will know of it at once.

So far as the pharmaceutical profession is concerned, those who desire to know how to proceed, need only observe what is now going on and assist in the movement. I cannot conceive of any better means of professional development than those now being employed, nor can I conceive of more hopeful and promising conditions than those which now surround us, if only the reactionary element can be suppressed. Let us briefly review the chief elements in the present situation.

The attempt of the National Association of Retail Druggists to make of the nostrum a professional standard, and the maintenance of its price the professional aim, has failed absolutely, and a feeling of shame is prevalent among the profession that it was ever attempted.

IS PHARMACY A PROFESSION?

The question, "Is pharmacy a profession?" has been hotly and ably disputed, and the overwhelming decision has been reached that it is a profession, and that it is to be made more so. The educational factions in pharmacy have gotten together and agreed upon a positive though cautious plan for eliminating the educational fakir from among them and for uplifting the standard.

Into the plans and operations of the promoters of the pure drug laws our profession has entered willingly and heartily, and of all the efforts at purification in our own ranks none have been so effective as those which have originated among ourselves.

We see the boards of pharmacy seeking co-operation, not only among themselves, but with the teaching element, to the end that harmonious relations may exist between the conditions of ingress to and egress from the pharmacy curriculum.

If these developments are unsatisfactory to a part of our profession; if

there are those among us who would seek to frustrate these efforts for good, it merely proves that our advance is to be like that of every advance recorded in history. If we were too indolent or cowardly to oppose, or too weak and incompetent to resist them, the responsibility would rest upon us, and we should deserve the failure which would result; but what evidence is there in the events of the last few years that any such result is to ensue?

MEDICAL MEN AROUSED AGAINST QUACKERY.

When we turn to the medical side of the picture we find conditions equally hopeful.

But a few years ago the American Medical Association, so far as its distinctly professional attitude was concerned, acted to no little extent as an instrument of quackery. To-day no one could ask for more active or efficient service in routing out quackery from both professions than is being done by the joint bureau, working under the auspices and direction of that association.

The medical profession too is growing wide awake as to its defective educational conditions. The best medical schools of this country have for some time been the equals of the best in the world; but they have been obliged to fight the same bitter contest against the methods of the sneak and the scavenger with which pharmacy schools are familiar, and they have made headway slowly, so far as general improvement throughout the country is concerned. Within two years, however, the whole body seems to have been set in motion in this direction, and it looks as though an early day might witness the exposure and discomfiture of all their false pretenders.

It is with a keen sense of satisfaction, and some pride, that we indulge the belief that it is the educational renaissance among ourselves which has participated in directing their attention to this much-needed reform.

Turning to the Pharmacopœia, which should represent the ideals of both professions, so far as its field extends, we have seen it, for many decades, one of the most useless, though always one of the best of books. To-day we see it being put to the most useful purposes. In this process, its practical defects are shown to be serious, even fatal, in some directions, and we may confidently expect that this exposure will lead in the near future to as great a perfection in this direction as this work has always exhibited in purely scientific lines.

FAITHFUL AND AGGRESSIVE WORK NEEDED.

"What should be the attitude of pharmacists to the medical profession? How can they best co-operate with physicians to forward the movement for improvement in both professions and for better appreciation of both by the lay public?"

My reply is, by faithfully and aggressively carrying on the work which we of both professions have already set in operation. We have no longer any need to be casting about for new plans and new means, excepting subordinate ones. It is the present duty of every one of us to make ourselves thoroughly familiar with the improvements and reforms now in progress and to find some place in the ranks where we can do a man's or a woman's work, supporting the weak positions, making converts, guarding against rashness and undue haste.

We are not taking part in this life for all that we can get out of it. The very best part of life is its voluntary sacrifices; the best part of our possessions, that part which we freely give away because it will do better work elsewhere than if retained in our own possession.

The Chairman said the address of Dr. McCormack and the paper of Mr. Rusby were now open for discussion, and he hoped many of the members would take part in the discussion of this highly important matter.

Mr. Diner, of New York, was the first speaker, and began by saying that he desired to take issue with Dr. McCormack on one or two of the statements made. As a member of the National Association of Retail Druggists, he objected to the oft-repeated statement circulated through the medical and pharmaceutical press, and finding its way into the daily press, that the N. A. R. D. maintains an expensive lobby for the purpose of protecting the nostrum manufacturers. No such lobby exists. He would have been guilty of neglect of duty as a former officer of the N. A. R. D., as a member of its Executive Committee, if he had not found out there was such a lobby, if such was the fact. He stated emphatically that such a lobby did not exist, notwithstanding any statement to the contrary. He said that the Committee on National Legislation had ever been active in a national way to promote and advance legislation for the commercial and professional interests of the retail druggists. In state legislation they had done nothing whatever. As to state legislation, the various state associations had found themselves quite frequently on the other side of the fence from the medical profession, because of the fact that some ill-advised person would seek to rush through the Legislature some act that would be disastrous to the public. All pharmaceutical legislation emanating in the various states for the protection of the public and to regulate the traffic in drugs had emanated from the pharmaceutical associations, and from them alone. In promoting legislation they have not endeavored to protect the cash drawer, but professional standards and the public at large. He cited the case of a bill introduced in the Legislature of the State of New York, a bill which prohibited the sale of *acetanilid* without the prescription of a physician, and said that the pharmacists had been asked to be accessory in depriving the public of a plain household remedy, without first consulting a physician and paying him a fee, but they had refused to do it. The pharma-

cists had always opposed the sale of narcotics. In New York the pharmacists were the first to propose the passage of laws against them. He denied the statement that seventy-five per cent. of the pharmacists of the country were engaged in such traffic for the sake of the profit to be derived therefrom. It might be stated with equal truthfulness that many of the physicians had been guilty of forming drug habits detrimental to the cause of humanity. The hypodermic needle has made many victims, which could never be reclaimed by legislation or otherwise, but the medical profession as a whole was not at fault. He would not say that seventy-five per cent. of the physicians were now engaged in dispensing narcotics. He maintained that the pharmacists were second to no profession in their honesty and truth. Of course there were blacklegs in the business; they are to be found among the members of all respectable associations. He maintained that the pharmacists were ready and willing to have their faults pointed out to them in a kindly spirit. None of us are faultless, but the correction should be done in a kindly way. We should hold out a hand to the erring brother. Let the two professions get together and try to accomplish something. One needs uplifting as much as the other, and both professions should strive to lift themselves up to that high level which the American Pharmaceutical Association lays down as the fundamental principle of pharmacy.

Mr. Hallberg expressed his hope that the members would not forget the advice of Solomon—Solomon Solis-Cohen. We cannot afford to discuss past matters, because it would be a waste of time. It is unfortunate that Dr. McCormack should have made this reference to his former statement before the American Medical Association, but it was necessary to make it here as a matter of history; it was because of that reference in Dr. McCormack's report to the American Medical Association that he was present at this meeting, and therefore it was proper that he should repeat it as a matter of history and to explain the situation to the members. He was satisfied that when Dr. McCormack left this meeting he would entertain different ideas concerning pharmacists from those entertained by him a few months ago when he made that report. As Dr. McCormack has said, by all means "let us cast away from the moorings of the past," as otherwise we will make no headway. We do not want to have the kettle calling the pot black. The word should be "Forward," and not "Backward." Mr. Hallberg illustrated the situation by quoting from a recent article in the public press by "Mr. Dooley," deriding the pharmaceutical profession of to-day. "Hennessy" was sick, and the doctor came and gave him a prescription—a prescription which was much more difficult to read than his bill—and told him to go to the drug-store and have it filled. There he met the "young scientist," who was busily engaged "in mixing a two-cent stamp for a lady customer." The young scientist was puzzled and turned it over to the "young pharmacist," who was "compounding an ice-cream

soda for his best girl," with the remark that the doctor's handwriting was getting worse and worse. The young pharmacist looked at the prescription and recognized it as the same old mixture the doctor always prescribed; so he told the young scientist that he could find it in a bucket in the back room there by the coal-scuttle. Then Mr. Dooley proceeded to "roast" the doctors worse than he did the pharmacists. The whole matter of medicine seems to be now the butt for the ridicule of the humorist and the satire of the caricaturist. The thing to do is to put behind us our common offenses of the past and jointly make an effort to elevate our status in the eyes of the public.

Mr. William Muir, of New York, agreed with Mr. Diner, and thought the imputation put upon the pharmacists should be resented. It was not true that pharmacists were out for the money and did not care anything for the patient. He recalled an effort made by the physicians to pass a bill when he was in the New York Legislature which would have prevented even paregoric from being sold as a household remedy. They wanted the whole thing in legislation, and did not want the Boards of Pharmacy to enforce the law. He thought that Dr. McCormack's statistics as to the Iowa Asylum inmates were incorrect. He had made an investigation himself, which went to show that the hypodermic needle was responsible for many more victims than the nostrums. His experience in New York had been that the medical men wanted to dominate always on committees and in the enforcement of the laws. He thanked God that New York did not have the National Pure Food and Drug Law. It would be a curse to any State when any drug might be sold that is labeled. He believed the Boards of Pharmacy were the proper ones to enforce the Pure Food and Drug Law, as the medical men had too many things to look after already.

Mr. Hynson paid a high testimonial to the character of Dr. McCormack, based on his personal knowledge of him. He had met him in the American Medical Association, and he assured the members that he had never lashed the pharmacists as he had his own profession. He said that Dr. McCormack had spoken as fairly of the pharmacists to the American Medical Association as it was possible to do. His object was, first, the benefit of suffering humanity, for those afflicted with disease, and, next, to elevate pharmacy with medicine. He himself was in hearty accord with this sentiment. Mr. Hynson also took occasion to pay a high tribute to the zeal and disinterested search after truth of Dr. Simmons of the American Medical Association.

Mr. Schulze expressed himself as in hearty accord with all that had been said about Dr. McCormack's position. He thought the physician should insist that his patients go to a reputable pharmacist. He cited an instance to the contrary in the city of Baltimore, where a certain pharmacist, who sold more cocaine and morphine indiscriminately than perhaps all the other pharmacists of that city put together, was patronized by some of the most reputable physicians of Baltimore, who sent their patients to his store.

Mr. Searby thought Dr. McCormack's statement that seventy-five per cent. of the cases of insanity referred to could be traced to the druggists was incorrect. He had to confess with some degree of mortification that for some years past he had not taken much interest in the subject of the relations between physicians and pharmacists. He said that in the city of San Francisco nearly every physician who wrote a good line of prescriptions got a per cent. on them from the pharmacists, and the man who stood out against that practice, as Emlen Painter and John Carter had done in their time, got the small end of the business. He thought pharmacists should stand upon their integrity and the quality of their work, and should maintain their dignity, and show to the world that they are working for the betterment of their profession, just as the doctors are doing. He thought pharmacists should stand side by side with the doctors, and insist upon being treated as equals by them, and not as inferiors. The two professions should get together, if they hoped to accomplish anything.

Mr. Lowe thought the Association should be grateful to Dr. McCormack for pointing out the causes of these sexual diseases. He had been told that seventy per cent. of a certain class of operations were brought about from such causes. He thought a higher standard should be demanded of our young men; they should be educated to a higher standard of honor and virtue, and he thought that the professors of *Materia Medica* had perhaps some duty to perform in this matter. He did not think any professor of *Materia Medica* could lecture intelligently on the subject unless he told about the physiological action of drugs. The professors in colleges of pharmacy should teach their students what they should do in cases of emergency in the absence of a physician, especially in cases of street accidents.

Mr. Bond, referring to certain statements made by Mr. Muir of New York, thought that this Association should go on record as endorsing the National Pure Food and Drug Law. That law does not permit the sale of poisonous remedies simply because they are so labeled, but requires that the patented drug shall be labeled before it is sold. In Arkansas they have laws forbidding the sale of cocaine and morphine separate and apart from the Pure Food and Drug Law.

Mr. Anderson said he thought Mr. Muir's objection was simply to the point that the Pure Food and Drug Law allows the retail druggist, or any dealer to dispense an official preparation of any strength he may select, provided he labels it. If it has a strength of twenty per cent. according to the Pharmacopœia, he can dispense it with the strength of five per cent. Mr. Anderson stated that he must agree with the gentleman—as all pharmacists who respect the official standards must agree—that this was a great mistake; that there should be but one standard, and that the Pharmacopœia standard.

Referring to Mr. Hallberg's remarks about not speaking of the past,

Mr. Anderson said he agreed with him to a great extent, but as to the suggestion that Dr. McCormack would go away with different ideas of pharmacists from those he came with, he could not understand how, if there was no discussion, he would have an opportunity to change his views. He believed that Dr. McCormack would not object to any discussion which would set him right in any respect in which he might be wrong. We want him to become informed, so that when he makes his next report to his Society he will not make the same report as before.

Mr. Anderson contended that in the work of bringing together the physicians and pharmacists the pharmacist was doing his whole duty. The sale of patent medicines was the bone of contention, apparently, and the doctors objected to the retail druggists dealing in these products. The position of the retailers was this: For years past these household remedies have been a part of their business, and there is no proof that they have injured the public, and in every instance where it has been pointed out that such remedies were injurious, they have done their duty and thrown these things out of their stores. (Applause). He cited an instance in New York, which he said had been followed in other States of the Union, where the use of cocaine was gaining such ground over the country, where the New York City Pharmaceutical Association, backed by the the Pharmaceutical Association of the State, had for years gone to Albany and attempted to pass an anti-cocaine law, to stop the sale of cocaine and restrict it to the physician's prescription only, that prescription not to be refilled under any circumstances without a written order from the physician; but not until this year were they able to pass such a law. But the agitation had been such that the Board of Pharmacy carried out that splendid work taken up in New York City, and had enacted a law, or regulation, that all preparations containing cocaine should be so labeled; and, without the druggists of this City being required to stop the sale of preparations containing it, nearly every druggist, the moment these preparations were labeled as containing these drugs, took them out of their shops and would not sell them to the public. He believed that as pharmacists and as individuals, and as associations with pharmacists, the pharmacists were doing their whole duty in this matter. If the physicians say we must throw patent medicines out of the store, then let them tell us what are the injurious medicines, and which ones we shall throw out; and if the facts are substantiated we will willingly throw them out and stop selling them. But where will you draw the line? No pharmacy in the country would be complete today, nor could the pharmacist fill the prescriptions that come to him from the physicians, if the shelves of these pharmacies were not filled with patent medicines! Therefore, he wanted to say to Dr. McCormack, as a retail druggist standing for the integrity of the profession, as a man aiming to do business fair and right by everybody, that the thanks of this Association and of every

retail druggist are due to Dr. Rusby and Dr. Cohen, and every other physician who has attended this or other meetings with the object of bringing the two professions together. All their differences should be set aside, and in a way satisfactory to each profession, to the end that the happiness and comfort and welfare of mankind may be best observed.

Mr. Hallberg asked permission to add a few words to what he had already said. He said he had listened to a public lecture by Dr. McCormack two or three years ago in a hall in Chicago. This was one of the lectures that the Doctor was accustomed to deliver in various large centers throughout the United States. He remembered particularly his making this plea: He appealed to the public that whenever they passed one of these elegant-looking establishments, with plate-glass fronts and gaudy signs on the windows bearing the words "Cut Rate Drug Store," to leave that place severely alone, because it was not an institution that should be patronized. Mr. Hallberg said he thought Dr. McCormack was fairly entitled to be a charter member of the N. A. R. D.

The Chairman invited Dr. McCormack to respond to the remarks of the speakers made in discussing his paper.

Dr. McCormack began by saying that he was deeply grateful to the members of the Association for the very appreciative, and, he felt, encouraging recognition of what he had had to say. Referring to the past, he would like to say that whatever had been done in either profession that was wrong should be forgotten, and each should try to do better. He was reminded by the prevailing situation of the man in a boarding-house in his city in the South, who passed his cup up to be refilled, and the landlady asked him if he would take tea or coffee. He replied that that would depend on what he had last; if that was coffee he wanted tea, and if it was tea he wanted coffee.

Continuing his remarks, Dr. McCormack said:

"I am grateful to the gentleman (Mr. Diner) who said that I had been misrepresenting the National Association of Retail Druggists. I am glad to be corrected on that point, so that hereafter I can meet these lobbyists face to face and say, 'You make a false claim when you say you represent any honorable association of druggists.' I shall use that with all the force of which I am capable. It seems to me that everything that has been said here to-day only confirms my plea that we can and ought to get together. In every county society that I have addressed, and I am sure if you could hear me speak to my own people you would not say I have talked harshly to you, I have already confessed to all that has been said by gentlemen here who have criticised me and my profession, but that is only important insofar as it can be made to help us for the future. As I started to say, I am asking the doctors and druggists in every county in the United States to get together in their county organizations and discuss and work out all these difficult problems, as men laboring in the same cause, for the good of humanity, should do.

"Referring to Mr. Searby's remarks, I believe if there is a doctor in the United States who is receiving a commission from the druggists, or a druggist who pays a commission to a doctor, each of them is a disgrace to the profession to which he belongs. Because I would rather take the money out of the pocket of a well man at night than to take it from a sick man day or night, and that is exactly what this commission business means.

"Now what I am pleading with you here to do is, that this great body of scientists—because I recognize you as such—shall get together with ours; that we may get in touch, your national committees and ours, and your state committees and ours. Let us discuss our points of difference in regard to the Pure Food and Drug Laws, and all these other questions, as rational men earnestly laboring in the cause of humanity. It is possible that many of our views are impractical; if so, we are broad enough to revise or to lay them aside. If some of your views are impractical, I am sure you will be glad to be informed. Why cannot your National Legislative Committee and ours join hands, and why cannot the same thing be done as to our state committees? Why cannot we make the Council of Pharmacy as much your organization as ours. I do not care how it all is brought about, so that we can get results. I believe we are one great profession, and I am not going to quibble about whether you swallow us up or we swallow you up, so we get together in regard to these life-saving, practical matters, more important to the people than to us.

"Now, in regard to the nostrum business, I believe it will be entirely practicable for some wisely selected committee of the two professions to formulate plans for, or to provide, harmless domestic remedies which may be safely sold to the people far cheaper, and still with more profit to the druggists than they get from the fake preparations. But we must get rid of the harmful ones; we must get rid of those that debauch the people; and it is for that I plead.

"If I have said anything to-day that would keep us apart let it be unsaid, because I am not here in that spirit. I am here holding out the olive-branch. We want to be one with you and to join hands with you, and I am sure that when I say this I speak the mind of every honest man in my profession, just as I believe that sentiment finds a responsive chord in every honest man in your profession; I say I believe I speak the mind of every honest man in both professions when I plead with you, in the language of our great soldier-commander—your commander, not mine, because I am a Southerner; yes, mine now—'Let us have peace,' but always an intelligent peace based upon honesty and justice to ourselves and the people." (Applause.)

Mr. Robert A. Hatcher, of New York, said he wanted to offer a resolution. He thought this organization of 2,000 men should embrace the opportunity of making friends of thirty-five times their number. In other words, the American Medical Association, with its 70,000 members, is

seeking the friendship of the American Pharmaceutical Association with its 2,000 members, and the members of this Association could well afford to meet the American Medical Association half way.

Mr. Hatcher then offered the following resolution :

“Resolved, That this Section request the American Pharmaceutical Association to direct that its Committee on Legislation shall co-operate with the Legislative Committee of the American Medical Association in the furtherance of such legislation as is designed for the mutual benefit of these two associations and the community at large.”

Mr. Whelpley and Mr. Eliel seconded this resolution, and Mr. Whelpley moved to amend it by inserting the words “National and State,” so that the resolution would read “the Committee on National and State Legislation of the American Pharmaceutical Association shall co-operate with the Legislative Committee of the American Medical Association,” etc., etc.

The resolution as amended was put to a vote and carried unanimously.

Mr. Eliel said that he had feelings which made it almost impossible for him to give utterance to the thoughts which had arisen in his mind in listening to Dr. McCormack and to the various responses that had been made. This was a thing he had worked for and lived for and tried to bring about in his own neighborhood—had fought for these many years—and it was now about to come to pass. He saw the dawning of the day ; he saw a light in the far East, a light which he fully realized he would not live to see shine in all its splendor, but which he felt that many of the younger members present would live to see. He was overwhelmed by this culmination of the closest possible relationship between the medical profession and the profession of pharmacy. He thanked God that he had lived to see this day, that he had been spared to be here at this meeting and hear the sentiments that were uttered this day.

Mr. L. E. Sayre, of Kansas, then offered the following resolution :

Moved, That it is the sense of the Section that, in order to promote fraternal relations between Medicine and Pharmacy, it recommends that the State Pharmaceutical Associations follow the American Pharmaceutical Association in seeking co-operation with State Medical Associations.

Mr. Whelpley seconded this motion also, with the suggestion that it be added that the General Secretary of this Association be requested to notify the Secretaries of the different State Associations of the passage of this resolution. This suggestion was accepted by Mr. Sayre, and the resolution as amended was adopted.

Mr. Hallberg said he desired to read certain resolutions that were adopted at the meeting of the American Medical Association in June last, with the view to having them incorporated in the Proceedings of this Association.

The following resolutions were adopted by the Section on Pharmacology and Therapeutics :

Resolved, That in State Drug Legislation the articles of the U. S. P., of the National Formulary and Physicians' Prescriptions should be exempt from the requirement of nam-

ing on the label or package the substances named in Section 7 of the Federal Act; alcohol, acetanilide, cocaine, morphine, etc.

RELATIONS OF PHARMACISTS TO PHYSICIANS.

WHEREAS, The reformation of the *Materia Medica* and the campaign for the more general acceptance of the U. S. P. and the N. F. makes essential closer relations between pharmacists and physicians, and

Whereas, The work of the physicians may be made more safe, sure and pleasant through a higher order of pharmaceutical knowledge, experience and skill, and

Whereas, The American Pharmaceutical Association—co-operating in this work, several of its members now serving on the Council of Pharmacy and Chemistry—in order to insure to physicians the fullest integrity and best pharmaceutical skill, asks the support of the medical profession in the efforts of its local branches to re-establish the professional practice of pharmacy.

Resolved, That the following subjects are approved as suitable for the local branches of the A. Ph. A. for discussion with medical societies as having a direct and practical bearing on this question :

1. The Status of the Prescription.
2. The attitude to "Patent Medicines."
3. Prescribing by Druggists.
4. Dispensing by Doctors.

The motion to incorporate in the Minutes the resolution as read was put to a vote and carried.

The Chairman stated that the next order of business was the nomination of officers for the ensuing year.

Thereupon Mr. Lowe nominated Mr. Joseph W. England, of Philadelphia, for Chairman; and Mr. Sayre nominated Mr. Charles H. La Wall, of the same city, for Secretary; Mr. Lowe also nominated Mr. Sayre, of Kansas, as one of the Associates; and Mr. Hallberg nominated Mr. Philip Asher, of Louisiana, as an Associate. Mr. Diner nominated Mr. Harry B. Mason, of Detroit, for Associate.

Mr. Mason tried to withdraw his name, but the Chair ruled him out of order, whereupon Mr. Mason nominated Mr. Joseph Feil, of Cleveland, for Associate. Mr. Sayre nominated Mr. Wilbur F. Scoville, of Boston, for Associate.

All these nominations were duly seconded.

On motion of Mr. Anderson, nominations were closed for this session.

On motion of Mr. Lowe, the Section then adjourned.

SECOND SESSION—WEDNESDAY AFTERNOON—SEPTEMBER FOURTH, 1907.

The second session of the Section on Education and Legislation was called to order by Chairman Oldberg at 3 : 30 o'clock p. m. ; the reading of the minutes of the first session was called for, but, on motion of Mr. Hallberg, the reading of the minutes was dispensed with.

The Chairman called on the Secretary to read the names of the gentlemen nominated for offices of the Section at the first session, and he did so, as follows : For Chairman, Jos. W. England, of Philadelphia ; for Secre-

tary, Chas. H. LaWall, of Philadelphia ; for Associates, Messrs. Lucius E. Sayre, of Lawrence, Kansas ; Philip Asher, of New Orleans ; H. B. Mason, of Detroit ; Jos. Feil, of Cleveland, and Wilbur L. Scoville, of Boston. The Chair called for further nominations, and called attention to the fact that he had reminded the members of the Board of Pharmacy to make some nominations at this time, as it seemed peculiarly fit that that organization should be represented upon this Committee. Thereupon, Mr. A. F. Sala, of Indiana, nominated Mr. Fred A. Hubbard, of Massachusetts, for Associate, and Mr. Mayo, in turn, nominated Mr. Sala for Associate, saying that Mr. Hubbard was President and Mr. Sala Secretary of the Association of the National Association of Boards of Pharmacy, and he thought it highly important that both officers should be associated in this work. Mr. Mason again asked leave to withdraw his name from nomination, and the Chair consented. Mr. Lowe moved that, in the case of those offices for which there was but one nominee, the Chairman cast the ballot of the Section electing these gentlemen. This motion was seconded by Mr. Hallberg and carried, and the Chair announced that he had cast the ballot for Mr. Jos. W. England for Chairman and Mr. Chas. H. LaWall for Secretary, and declared those gentlemen duly elected. The Secretary again read the list of nominees for Associate, leaving out Mr. Mason's name and adding those of Messrs. Hubbard and Sala. On motion of Mr. Mayo, a ballot was ordered, the three receiving the highest vote to be declared elected Associates for the ensuing year. The Chair appointed Messrs. Lowe and Diner as tellers to take the vote.

While the tellers were engaged in taking and counting the vote for Associate, the Chairman made a statement, and said that what had taken place in the forenoon gave promise of better times in the near future. The pharmacy law had been severely criticised, and one criticism was, that it starts out by saying that none but competent pharmacists shall be permitted to dispense medicines. Next it goes on to make certain exceptions ; anybody who wanted to sell, prescribe and dispense medicines could do so without being a competent pharmacist. It reminded him of the situation at a certain university where the students had a somewhat similar organization. The first article of their constitution read something like this, "No member of this society shall indulge in any kind of intoxicating drinks." The second article reads : "Section 1 of this Constitution shall not be made operative when any member is eating fish." The third article of the constitution went on to say : "All eatables may be regarded as fish except cheese." The fourth article read : "When there is nothing to eat except cheese, that, too, may be regarded as fish." (Laughter.) Mr. Oldberg said that that was the way with the pharmacy laws ; first, there shall be a certain standard of qualification, and they provide that those who practice pharmacy or fill prescriptions must be competent ; then they provide that those who are engaged in the business of preparing and dispens-

ing medicines on a still larger scale can do so without being competent. He thought that what transpired this morning was going to establish a better understanding of these matters in the future. He pointed out a defect in the pharmacy law to which attention is called in the program in Question 5. He did not think it would take up much time to dispose of that question, and he thought it would be taken up immediately after the announcement of the vote by the tellers.

The Secretary announced that the tellers had completed their work, and had reported that the three nominees receiving the highest vote for Associates were : Fred. A. Hubbard, 19 votes ; L. E. Sayre, 18 votes ; and A. F. Sala, 16 votes. Thereupon, the Chair declared these gentlemen duly elected as Associates on this Committee, to serve for the ensuing year.

The Chair then called for action on the resolution printed under the Fifth Query in the program, namely :

Resolved, That it is the sense of this Section on Education and Legislation of the American Pharmaceutical Association that pharmacy laws which are so worded that they permit or can be construed to permit the issuing of licenses to minors and persons without definitely prescribed educational qualifications to open or conduct drug stores, to have charge of the dispensing of medicines, and to sell habit-producing drugs, cast unmerited reproach upon our occupation, and should be amended.

The Chair stated that in his address he had called attention to the fact that in eight States of the Union the law specifically says that the young man of eighteen is entitled to license, if he can pass the examination, to sell cocaine, morphine, etc., and in a number of other States nothing is stated about the age of the licensee. He thought the Association should protest against the reproach cast upon pharmacy by such laws. He was aware that they had in these States all they could do to prevent minors from getting licenses to compound prescriptions, but he thought notice should be taken of this condition.

Mr. Lilly, seconded by Mr. Schulze, moved the adoption of the resolution as read.

Mr. Lowe thought the resolution a step in the right direction, but stated that in Pennsylvania they had two classes of pharmacists, the registered pharmacist, the higher grade, and the qualified pharmacist. According to this law, the qualified pharmacist does not have to be twenty-one years of age, and he can be left in charge of the store for a reasonable length of time in the absence of the proprietor. But this resolution would prevent anything of that kind and would work a hardship. He thought many young men under twenty-one years of age were capable of taking charge of a store for a few hours, that it would be a hardship on the retail pharmacist to deny them this privilege, and they had enough troubles already without adding to their burden.

Mr. Muir, of New York, agreed with Mr. Lowe. He said that in New

York, in the rural districts, owing to influence with the legislators—it was different in the larger cities—the age limit had been set at eighteen years. In the cities of one million inhabitants and over the young man must be twenty-one years of age, but in the country they had to compromise, and there the young man of eighteen could be licensed as a druggist and could go into business on his own account in any city or village containing not over five hundred inhabitants. They could not pass such a law as was proposed in that State.

Mr. Hynson said he did not understand the resolution to say that the law *must* be amended, but *should* be amended, and that meant as soon as practicable. He asked the Chairman if he was correct in this statement. The Chairman said it was intended to mean that. It was a protest against minors having charge of the dispensing of medicines and selling habit-producing drugs.

The Chairman further said, in answer to Mr. Lowe, that when an employee is left in charge of a store temporarily, it is not intended to cover that, for he is just as much an employee as before, and is responsible to his employer. This resolution simply expresses the moral sense of this Association concerning the entrusting of the responsible calling of pharmacy to minors.

Mr. LaWall thought the educational qualification was more important than the age requirement.

Mr. Lowe suggested the omission of the words "to minors and." He would approve the resolution with that elimination. He read the resolution with these words out to show its effect.

Upon further explanation by the Chair that the law in eight States did specifically allow the registration of young men of eighteen, if they passed the board examination, Mr. Lowe withdrew his amendment, and the Chair put the motion on the resolution as originally read and it was adopted.

The Chair then read the Second Query of the Program: "Are the conditions in the drug stores of today such as warrant the assumption that those admitted to apprenticeship can there acquire the education requisite to make them competent pharmacists. What instruction do the apprentices and clerks receive in the average drug store?"

The Chairman added that Mr. Jacob Diner, of New York, would lead in the discussion of this Question.

Mr. Diner began by saying that he believed no better introduction to the discussion could be had than the apt definition given by the Chairman of the Section in his address: "Education consists of the orderly and harmonious development of the faculties, to the end that they may be more effectively used. Loading the memory with facts, however important and useful these facts may be, is not education." That struck the key-note of the situation today. He thought the second part of the Question would answer the first part. Now, what are the reasons that induce the

proprietor to engage an apprentice? Not the desire to start the young man on a career as a pharmacist, or to bring into the field of pharmacy men that will be a credit to it. The main reason is, that a certain amount of work has to be done in the store, for which the services of the senior clerk are too expensive and those of the porter are not efficient enough. No examination is made of the applicant as to preliminary qualifications. He is not even asked, in nine cases out of ten, whether he can read or write. He must be strong enough to run errands, attend to the soda fountain, and so on.

In olden times, the apprentice was engaged by the apothecary under a system of apprenticeship papers. He had to have a school education and he was bound to the apothecary for two or three years, as the custom of the particular country happened to be, and the apothecary had certain rights and privileges, even to the infliction of bodily punishment upon the apprentice, if necessary. He went into the store, regaled with a lecture on the ethics of pharmacy, its high aims and ambitions, and was made to feel that he had chosen a high and important profession in life. Such labor as was necessary to be performed was assigned him to do, and he received such instruction as the assistant could give him. All this under supervision of the apothecary himself. The proprietor was responsible—and is to-day responsible in Continental Europe—to the Board of Pharmacy, or to a commission, or whatever the body happened to be, for the proper advancement and education of the youth in matters pharmaceutical. According to the length of time the apprentice had been in the store, he had to show a certain knowledge in the profession of pharmacy.

But what are the conditions to-day? Mr. Diner said he was not here to throw any "mud" at the profession of pharmacy, but this discussion was for the purpose of remedying the evils that prevailed, and he felt this was the time for plain speaking. Now, the boy goes into a pharmacy and gradually becomes more and more useful, putting up powders and the like. He gets no explanation as to why a seidlitz powder is put up in two parts, and things like that. If he finally acquires any knowledge, it is because he persists in asking questions. As to systematic instruction by the proprietor, excepting in a very few cases, it does not exist. If the mind of this boy, perhaps well qualified by reason of a good preliminary education, had been trained, as Mr. Oldberg says, in the development of the faculties, so that they could be more effectually used, then he would seek information intelligently, because in the high school he has been taught to ask *why*—Why are certain things thus and so? He has been taught there to argue, to reason and deduce; he has been taught to put two and two together. He will figure out for himself the questions that present themselves, if he cannot get an explanation from his superior. History tells of the beautiful development and enormous growth of art, science, literature, etc. The building in which the Section is now meeting

was a good illustration of the advancement in architecture, and Mr. Diner referred to its firm foundation, and asked the same thing for the boy entering pharmacy. He spoke for a better education than that ordinarily required in the average school.

The Chair then called upon Mr. O. A. Wall, of St. Louis, to read a paper he had prepared along this line.

Mr. Wall stated that in preparing his paper he had written it rather under the terms of the sixth question on the program, which allowed the writer considerable latitude, and it might not be quite so much in point here as the remarks that had just been made. Thereupon he proceeded to read his paper as follows :

WHY WE SHOULD NOT DEMAND A HIGH SCHOOL PREREQUISITE FOR COLLEGES OF PHARMACY.

BY OTTO A. WALL, PH. G., M. D.

While it may be admitted that higher education is quite desirable for pharmacists, it is at the same time true that it is not so absolutely indispensable that it must be made compulsory, either by resolutions of the Conference of Faculties of Pharmaceutical Colleges, or far less so by the laws of the various states.

It will be conceded that if we could make college education in pharmacy more popular and more general than it is now, an immense gain would be had even if colleges of pharmacy remained as they are now, without raising their entrance requirements or increasing their educational demands. At present the great majority of applicants for registration before state boards of pharmacy are not graduates from any college, and an overwhelming majority of them have never attended a college of pharmacy at all.

To improve such a condition, we should not make entrance to colleges of pharmacy more difficult, but easier. We should begin to improve educational conditions from the bottom up, not from the top down. To be able to do this we must understand the conditions, just as a physician must make a diagnosis before he can prescribe a remedy ; we will therefore ask a few pertinent questions and let the published opinions of prominent educators of our country answer them.

WHY ARE OUR STUDENTS FROM THE GRAMMAR SCHOOLS NOT BETTER EDUCATED.

Mr. Edwin C. Cooley, Superintendent of Public Schools in Chicago, answers in the Philadelphia *Saturday Evening Post*, for June 8, 1907, as follows :

There is no denying that our public schools are doing too much overhead shooting. . . . Probably this tendency to overshooting in our public-school educational system shows more plainly in our high schools than elsewhere. What is a common-school edu-

cation for, unless it be to fit the mass of pupils for the practical duties of life? And if the high school leaves its pupils with only a preparation for college instead of a preparation for life, when most of the pupils cannot go on to college, does it not score a lamentable failure in efficiency and overshoot the mark? . . .

The effect of treating the high school as a college feeder rather than as a people's college is felt all along the line of the elementary grades. The course of study in the lower grades is made subservient to the idea of high school graduation in the same way that the high school course is framed to fit the idea of the college or university. The grades of pupils are put through studies which no reasonable human being would assign them on any supposition other than that of graduation from high school and passing on to college. And yet it is a certainty that only a small percentage of grade pupils enter the high school, to say nothing of being graduated from it, while the percentage of those who reach college is almost infinitesimal.

Common-school training should be a common-sense training, adjusted to bear directly upon the reasonable expectations of the mass of pupils, upon the needs of the community, and the needs of the individual in his relation to his community. . . . After all utility should be the supreme test in education. And this standard should be especially applied in shaping the course of study in the common schools. The statement that the curriculums of the public schools will not generally stand this test may be a surprise to many parents, but such is the lamentable fact.

That these defects exist in our common grammar schools everyone familiar with public education knows, although there may be many who would not like to admit it in public. Since these shortcomings cannot be remedied by ignoring or denying them, our first duty should be to bring pressure to bear to improve the educational facilities for the children of the masses, the children who must go to work at a comparatively early age; this is of more importance and will be of more far-reaching effect than the effort to enforce academical requirements for the children of the upper classes. It ought not to be difficult to so improve our grammar schools that graduation from them would be more than equivalent to two years' attendance in high school under present educational conditions.

But, some may say, these defects in our schools are to be found only in the backwoods, or in the newer states and territories!

ARE THESE DEFECTS ALSO FOUND IN OUR CITIES.

Let Mr. William J. Shearer, Superintendent of Public Schools in Elizabeth, N. J., answer this question. I quote from an article on "School Children in Lockstep," in *World's Work*, August, 1907:

The following extract is from an editorial in the *Philadelphia Ledger*:

There is in the United States a city only 72 per cent. of whose children attend the public schools. Of these, only seven-tenths of one per cent. pass through the high school, only 4.3 per cent. reach it. Eighty-four per cent. leave before they have gone half way through the grammar school. Sixty-six per cent. go only through the primary grades; fifty-three per cent. stop at the second reader.

The city in question is facing a future in which there is no assurance that one quarter of its population will be able to write their names, or more than half its population be able to read . . . or do such simple sums as can be counted on the fingers; or one-

eighth possess the merest rudiments of knowledge; or one in twenty-three have mastered the common branches; or one in 143 have availed themselves fully of the education provided by the State. . . . The city is Philadelphia. . . .

These facts are well-nigh incredible, but being beyond doubt, they afford reason for the most humiliating reflections, and call for instant resolution to seek for the causes of a condition so terrifying.

Every member of this Association should read the article referred to. He will find there some very surprising and humiliating statements regarding another great city and State—New York—which will convince him that there has been too much “hurrah” and false pretense in much that the public has been taught to believe is almost faultless education.

I have during the past year directed attention to the educational conditions in various States, and have demonstrated that only a very small fraction of one per cent. of American children ever get an education that is equivalent to graduation from high school, because either they live where there are no high schools or they have no money to attend them. There is no such thing as “free high school education!” High school education, even where tuition is free, is beyond the means of most children, because comparatively few can afford to pay necessary expenses for four years without earning anything; and tuition is not even free to a very large proportion of American school children.

WHY ARE OUR GRAMMAR SCHOOLS NOT BETTER THAN THEY ARE?

It has been a common complaint in most of our higher schools of various kinds that the children now coming from the common schools are not as well qualified as when we ourselves were girls and boys. This is not merely our imagination or our self-conceit, but it may be conceded to be a fact. In fact, it is the cause for the present unreasoning clamor for a high school prerequisite for colleges of pharmacy.

I say “unreasoning” advisedly; our complaint is mainly that our students come to colleges of pharmacy with too little knowledge of arithmetic; that they are unable to work examples in percentage; therefore, we demand “one year in high school.” Arithmetic is not taught in our high schools; it is taught in the grades. Therefore, it is unreasonable to demand one year in the high school to secure better knowledge in a branch that is not taught in high schools. Demand better common school education, and compel the school authorities to sit up and listen.

The editor of the *St. Louis Republic* of June 9, 1907, answers the above question:

The country schools, in fact the primary and the common schools, too, have lost their grip, or at least their quantity and quality are not equal to the demand, and higher education has been fed, forced, coaxed, pushed and philanthropied out of all fair proportion to primary and lower instruction.

This means that the State and philanthropists have been improving education at the

top. We are so overwhelmed with colleges that we are at our wits' end to supply them with pupils. . . .

Upon the other hand, the need of the masses for primary forms of education, especially out of the cities, never was so poignant or so great.

The fact that young men and women are fitted for and are about to enter college is *ipso facto* proof that they are people of some means, at least not Children of the Abyss. Therefore, the colleges are for the greater part only for the chosen and elect.

States levy taxes and philanthropists levy glory by erecting, establishing and maintaining colleges for the few and fortunate. Meanwhile the many and unfortunate are neglected. . . . Mr. Carnegie, Mr. Rockefeller, and others have begun wrong. They are cultivating the Tree of Knowledge at the top by spraying the leaves, while the roots are perishing in unfertilized soil. This is contrary to all sound principles of arboriculture. First, a sound root; then a sound tree. Begin at the bottom.

But this would hardly suit our academic friends, the university men, because, if the conviction expressed by the editor of the *Republic* were generally accepted by the public, it would inevitably reduce the appropriations for the (so-called) "universities" in order to apply the money to the more urgently needed education for the children of the people.

ARE CONDITIONS IMPROVING IN OUR SCHOOLS?

They are, mainly because there have appeared educators who have had the moral courage to tell the truth and point out the defects. The "slump" in education, which was so marked a feature of the last decade or two, was produced by the introduction of various "fads" in our schools, such as Kindergartens, learning to read without spelling (the "phonetic" or "syllable" method), language lessons instead of grammar, etc. But let Dr. Arthur Twining Hadley, President of Yale University, tell us about this (from an interview published in the St. Louis *Globe-Democrat*, July 7, 1907).

We have introduced all through our schools a good many kindergarten methods and a good many studies which are of the nature of play. . . . When these play studies begin to be valued for their own sake there is trouble. There was a time when we had a good deal of that trouble. There was a generation of boys and girls who could not spell or make a sum come out right, or accept the responsibilities of hard school work of any kind. Fortunately the worst of this period has passed. Our boys to-day spell better, and work harder, and have more intellectual responsibilities, than they did five or ten years ago. . . .

There was a noticeable deterioration, however, from about the year 1895 to 1902. It was then that American colleges got their first crops from the kindergartens of the country. The students were deficient in spelling and the use of English. . . . The first kindergartens were extreme in their methods. They are improving, I am glad to say, and are no longer open to serious criticism.

If we will have patience to wait a few years longer, we will find conditions in the grammar schools so improved that "one year in high school" will not be needed to improve on present conditions.

DO THE UNIVERSITIES SERVE FOR THE GREATEST GOOD OF THE PUBLIC, OR FOR THE GREATEST GOOD OF THEMSELVES?

Prof. John R. Kirk, President of the State Normal School at Kirksville, Mo., answers this question in the *St. Lewis Republic* for June 23, 1907, as follows :

There are trusts and monopolies in education as elsewhere. The big universities seek to focus all energies upon higher education (so-called) and to bend all things below them to their own purposes. They are organized and firmly knit together. They know one another well. They are mighty monopolists. We need universities . . . but they ought not to be in abnormal relation to other things. They make our school system top-heavy.

In New England and to the north of us the universities exploit all education and force all public schools to become special preparatory schools for the universities. Nearly every university supports a teachers' agency, composed of faculty men, and called the "committee on positions and recommendations." One member of the committee is a traveling agent, and called the "high school inspector." He represents this bureau. He fixes high school courses of study, watches for vacancies, in a large measure controls the appointment of high school teachers, and strives to concentrate the attention of high school students upon the university.

It is an open secret that the so-called "small college," hitherto one of our main reliances in American education, is to be throttled and driven out. That some of our formerly independent colleges of pharmacy have been compelled to succumb as independent schools, and to seek affiliation with universities is deeply to be regretted for the sake of pharmacy itself, but—" 'tis true; and pity 'tis, 'tis true!"

SHOULD COLLEGES OF PHARMACY BE UNIVERSITY DEPARTMENTS?

The majority of our state "universities," even those that are not really universities at all, try to maintain the old academic ideals and traditions that have been handed down to us from generation to generation, from the times when "education" was supposed to be the exclusive privilege of the leisure classes.

A rational modern idea of the relation of schools to each other on a proper system of education, is somewhat as follows :

<i>Primary Education.</i>	<i>Secondary Education.</i>	<i>Higher Education.</i>
Primary and Grammar Schools.	Manual Training Schools, Agricultural Colleges, High Schools, Academies, Technical Trade Schools, Business Colleges, etc.	Normal Schools, Professional Colleges, and Universities.

Be it admitted, for argument's sake, that the way through high school to the academic higher institutions is the best way; as long as high schools are not more generally available, or of more satisfactory educational value than at present, it ought not to be the only way to enter professional colleges or universities. When universities introduce "departments" that really belong to the secondary group of schools, as, for instance, depart-

ments of pharmacy, the latter do not thereby become real university departments, but should be considered secondary schools like the high schools, the equivalents, collaterals or alternatives of the high schools; and it should not be necessary to go through high school or to go to high school at all, as a preliminary to a business or trade education.

Pharmacy schools, to train drug clerks and retail pharmacists, are essentially technical trade or business schools; they rank with high schools and not above them; they are alternatives for high schools, and not legitimately university departments at all, therefore should not demand university prerequisites.

IS THIS A RATIONAL EXPLANATION OF THE RELATION OF A PHARMACY SCHOOL TO GENERAL EDUCATION?

Dr. Arthur Twining Hadley, President of Yale University, in an interview already referred to, answers this question:

I certainly do not think that everybody ought to have a college or even a high school education. But it seems to me a mistake to separate boys into those who propose to go into business or professions, as if that were a natural and fundamental division. I believe that every boy whose parents have the necessary money should go on with his general education as long as opportunities for culture and the ideals of public spirit which it inculcates appeal to him. The instant that appeal ceases to have force let him begin a technical course which will lead him to his work as soon as possible. When the culture motive stops, the money motive must come in. But I know many men in trades who would have gotten the fullest profit out of a college education, and some men in commercial and professional life with whom the time spent in college or in the high school was pretty largely thrown away.

In other words, if a boy or girl has taste for academic culture, and ambition to go to high school and further, he or she should do so if the parents can afford to pay for it; but if for either of two reasons, lack of inclination or lack of money, they cannot go to high school, let them go direct to a school that will teach them the trade or business they intend to follow. In this sense a college of pharmacy or a business college for bookkeepers, stenographers, etc., or a manual training school for engineers, mechanics, electricians, draughtsmen, chauffeurs, etc., is not in the ascending line in academic education, but is collateral or parallel with the high school.

This does not mean that men who aspire to the highest positions in these respective callings will not do well to complete a full academic course, but merely that the rank and file, the overwhelming majority of those who intend to follow these callings, do not need the academic training to become efficient, competent tradesmen or business men.

SHOULD ALL WHO WANT TO BECOME PHARMACISTS GO TO COLLEGES OF PHARMACY?

From the selfish standpoint of a professor in such a school, I might be

tempted to say "yes" to this question ; but from a broader, fairer standpoint of honesty, the most that can be said is, that all who can afford to do so would find a college training a great help to success in life. Every boy who enters pharmacy as an apprentice should make it his aim to get a college education, if possible. But it should not be made absolutely obligatory.

The President of Yale University said :

Desirable as it is in all respects, a college education may cost too much. It is not worth the surrender of one's self-regard or self-reliance. A mother and her daughter deprive themselves of the necessities of life, go hungry, perhaps, as well as shabby, that a son and brother may stay in college four years. An education is not worth such a sacrifice. The duty of a son and brother is to help his mother and sisters, if they need it. A college course at the expense of their physical welfare is a hardship on them and a positive injury to the student.

Fortunately the boy who finds himself in this predicament can make his way in the world by application to study without going to college. The common-sense question should be : Has he learned to know a certain subject? The academic question would be : Has he learned it in high school in a certain number of academic units of eight months' work of not less than four forty minute periods each week?

Thousands and tens of thousands of such young people have found the correspondence schools the ladders by which they have risen to success. No laws ought ever to make it impossible for such youths to climb.

THE ATTENDANCE AT UNIVERSITIES.

In the following table I quote the attendance from the various States at the seventeen most prominent universities of our country, as given in *Science*, July 26, 1907.

The list is not quite fair because it includes some state universities while omitting others, thus making the attendance from some states whose universities are not included, seem small as compared with that from states whose universities are included. On the other hand the state universities so included in the list are really "universities," with more than local reputations, while many, if not all of the other state universities not included are not really "universities," but are only called so.

The first column of figures shows how many students from each state attend these 17 universities ; the second column shows the population (1900 census) of the states, and the third column shows approximately how many persons out of every 100,000 population attended these universities in the year 1906-1907 :

<i>States.</i>	<i>Students.</i>	<i>Population.</i>	<i>Per 100,000.</i>
New York.....	7,052	7,268,894	98
Illinois.....	4,313	4,821,550	88
Pennsylvania.....	4,281	6,302,115	68
Massachusetts.....	3,909	2,805,346	139
Wisconsin.....	3,246	2,069,042	162
Ohio.....	2,946	4,157,545	72
California.....	2,788	1,485,053	186
Michigan.....	2,573	2,420,982	107
Connecticut.....	1,423	908,420	158
New Jersey.....	1,394	1,883,669	73
Rhode Island.....	671	428,556	134
Virginia.....	540	1,854,184	28
Indiana.....	477	2,516,462	19
Iowa.....	417	2,231,853	19
New Hampshire... ..	407	411,588	102
Missouri.....	379	3,106,665	12
Maryland.....	289	1,188,044	24
Maine.....	250	694,466	36
Minnesota.....	231	1,751,394	13
District of Columbia.....	227	278,718	76
Kentucky.....	226	2,147,174	11
Colorado.....	222	539,700	44
Vermont.....	191	343,641	63
Texas.....	149	3,048,710	5
Kansas.....	141	1,470,495	9
Tennessee.....	125	2,620,616	6
Nebraska.....	123	1,066,300	12
Washington.....	114	518,103	23
Alabama.....	113	1,828,697	6
West Virginia.....	100	958,800	10
Georgia.....	97	2,216,331	4.4
Delaware.....	93	184,735	42
North Carolina.....	93	1,893,810	5
Oregon.....	93	413,536	23
Montana....	88	243,329	33
South Dakota.....	70	401,570	17
South Carolina.....	67	1,340,316	5
Utah.....	67	276,749	24
Mississippi.....	64	1,551,270	4
Arkansas.....	50	1,311,564	3.8
Louisiana.....	49	1,381,625	3.5
Florida.....	43	528,542	8
Oklahoma.....	38	398,331	9.5
North Dakota.....	37	319,146	12
Idaho.....	18	161,772	11
Wyoming.....	18	92,531	19
New Mexico.....	15	195,310	8
Arizona.....	13	122,931	11
Nevada.....	11	42,335	26
Indian Territory.....	10	392,060	2.5

Let it be conceded that, in a general way, the attendance at the great universities is a gauge of educational conditions in the respective states, and it follows from the vast differences shown in the last column of above table, that it is impossible at present to enforce a uniform rule for admission to colleges of pharmacy, regardless of geographical location or educational conditions.

For instance, if the representatives in the Conference of Pharmaceutical Faculties from New York, with 98 university students per 100,000 inhabitants ($\frac{1}{10}$ of 1 %), Illinois, with 88 per 100,000 ($\frac{1}{11}$ of 1 %), Massachusetts, with 139 per 100,000 ($\frac{1}{7}$ of 1 %), or Wisconsin, with 162 per 100,000 ($\frac{1}{6}$ of 1 %) really think that colleges of pharmacy are academic schools and that they ought to ask a high school prerequisite for entrance to a college of pharmacy, it would nevertheless have been very unfair on their part to vote to compel the students of pharmacy in Missouri, with 12 university students per 100,000 ($\frac{1}{8}$ of 1 %), Kentucky, with 11 per 100,000 ($\frac{1}{9}$ of 1 %), Kansas, with 9 per 100,000 ($\frac{1}{11}$ of 1 %), Tennessee, with 6 per 100,000 ($\frac{1}{16}$ of 1 %), Georgia, with 4.4 per 100,000 ($\frac{1}{22}$ of 1 %), or Louisiana with 3.5 per 100,000 ($\frac{1}{28}$ of 1 %) to meet the same academic requirements; and any claims that might be made by the representatives of the latter states, that their states are in a position to comply with such requirements would be absurd exhibitions of false pride and false pretense, absolutely at variance with the officially published statistical facts concerning their states.

The main reason why some of the states show such small attendance at the universities is not that there is no appreciation of education in those states, but that the states are new or financially poor, and high schools are not generally accessible to the children of these states, and as the universities demand a high school prerequisite qualification, and some of these states have no high schools or only a few of them, the young men and women from such states are barred from universities, not necessarily because they are not qualified to profit from university education, but because they are unable to comply with a technicality.

As a rule, also, the newer the state the more demand is there for labor, work, business, enterprise, and the less leisure is there for gentlemanly loafing (an incentive that accounts for the presence of many students at the universities), and, therefore, the smaller is the number of young people who can afford time for university education.

IS COLLEGE AND UNIVERSITY EDUCATION NECESSARY FOR SUCCESS IN LIFE ?

Mr. Newell Dwight Hillis, in the *St. Louis Post-Dispatch* of August 4, 1907, answered as follows in an article entitled "The World is a School-House :"

Our age and civilization represent a large school-house, where events are the teachers. . . . For the boy who knows how to ask questions, every man becomes a teacher. . . .

For education is not an accumulation of facts. Culture is not the stuffing of memory with dates and names. Education is an awakening. . . .

The college is not the only school room. The boy with his diploma must not think that the man who has not been to college is of necessity an ignorant man. That standard would make Burns and John Bunyan and Lincoln blockheads, would turn Jenny Lind and Sappho into dunces. The English bard never went to college, but he held a culture quite equal to the polished sentences of Samuel Johnson and Edward Everett. The occasional cad, fondling his diploma and despising every man who is not university bred, justifies the epigram that colleges are places where brick-bats are polished and diamonds are dimmed.

WILL THE HIGH SCHOOL CONTINUE TO BE MERELY A FEEDER FOR HIGHER INSTITUTIONS ?

Mr. Eugene C. Warriner, Superintendent of Schools in Saginaw, Mich. (in Michigan *Alumnus* for June, 1907), answers :

However true it may be that secondary schools were called into being in response to a demand for students properly fitted to enter higher institutions of learning, the community has long since realized that the high school is in reality the people's college. It is not a university, but it may afford to a great mass of young men and women the elements of higher education beyond the absolute needs of the common schools and of every-day life, which shall fit them not only to make the most of life, but to become leaders in their respective communities. The first duty of the high school is always to the community which supports it. This must never be forgotten. The slight feeling which may at times be expressed against the university has no doubt arisen from this thought, that the university authorities were perhaps forgetting this paramount duty of the high school, and regarding the high school as solely a fitting school or branch of the university.

The high school will no doubt fit men and women for universities in the future as it has in the past, but it will not be conducted with mainly this end in view. The high school will not merely be the means to an end in education, but it will itself be the aim and end of the education of the people, and its relation to the universities will be only an incidental phase.

From the grammar schools, when perfected by the many able men who are now laboring with this problem, the pupils will pass to high schools, academies, seminaries, manual training schools, colleges of business and of trades, agricultural schools, etc., and the millions of people will consider their education (as far as schools are concerned) completed when they have gone through one of these. Only a few will go from the high schools to the higher schools, and I am not sure that the way to the latter will always continue to be necessarily through the high school.

WILL COLLEGES CONTINUE TO DEPEND ON HIGH SCHOOLS FOR STUDENTS? WILL

A HIGH SCHOOL EDUCATION ALWAYS CONTINUE TO BE A PREREQUISITE FOR ENTRANCE TO COLLEGES AND UNIVERSITIES ?

I have already stated my belief that technical trade and business colleges should not demand such a prerequisite ; many of them do not, and others

which now do will no doubt discontinue to do so ere long. In a valedictory address to the 1907 class of the Syracuse (N. Y.) University, Dr. Andrew S. Draper, the Commissioner of Education for the State of New York, answered the above question as follows :

The American colleges will be obliged to work in accord with the overwhelming number of universities, colleges and secondary schools taken together. They will have to accept students who can do their work and who want to do it, without so much reference to how or what they have studied somewhere else. The western boys and girls say that under the accrediting system, by which institutions are examined more than students, it is easier to get into western than into eastern universities, but that once in it is hard to stay in a western university, while one who gets into an eastern university can hardly fail to be graduated if he will be polite to the professors and pay the term bills. And the western people say that their way is best; that every one must have his chance; that at least his chance is not to be taken away upon a false premise; that if he "flunks out" after having had his chance it is his fault, and no one is going to worry about it, and that it is better to regard the graduation standards and apply them to four years' work than that the faculty must know all about than to make a fetish of entrance requirements and have so much ado about prior work—about which they can know very little at best. It is all worth thinking about. I am not a westerner; I am thoroughly a New Yorker. But I am for the open, the continuous and the smooth road from the primary school to the university, and for everyone having his chance without any likelihood of his losing it upon a misunderstanding or a hazard.

Our democracy is developing a new kind of civilization; our system of common schools, primary and secondary, has brought forth a type of advanced schools peculiar to the country. Institutions that would prosper may better recognize the fact. The universities that would thrive must put away all exclusiveness and dedicate themselves to universal public service. They must not try to keep people out; they must help all who are worthy to get in. It is not necessary that all these institutions shall stand upon exactly the same level; it is necessary that each shall have a large constituency. . . .

It is imperative that all shall value the man at his true worth and not reject him because his preparation has lacked an ingredient which a professor has been brought up to worship.

It is to be regretted that the Conference of Pharmaceutical Faculties thinks of introducing the obsolescent academic prerequisite of high school attendance just when the leading educators of our country are awakening to the newer requirements, finding that traditional academic prejudices are not as essential as they were once believed to be; just when educators commence to realize that high school attendance may be a meaningless formality and technicality when compared with the worth of the prospective student himself. Let us cast loose from the fetters and traditions of the dying past and join in the liberal educational movement so well described by Chancellor Winfield S. Chaplin, in his address at the celebration of the fiftieth anniversary of Washington University of St. Louis, on June 20th, 1907 :

Entrance to Washington University is easy, the only requirements being that the student is prepared to profit by the instructions of its teachers. Its degree is based neither

on age, nor sex, nor time of study, but on work and advancement. Its rules are few, its privileges many. It has but a single aim—to stimulate mental growth.

The Chairman called for a discussion on Mr. Wall's paper but said he desired to remind the members that there was a very limited time to devote to the subject, and the discussion would be limited to five minutes for each one taking part in it. He called on Mr. Taylor to say something on this subject. He added that when he read Mr. Wall's paper and accepted it to be read before this Section, with the consent of the other members of the Committee, it was with the idea that, while he was not quite sure that Mr. Wall's presentation had any direct bearing upon the proposition of admitting students to pharmaceutical schools without some preliminary education still, he wanted him to have an abundant opportunity to exhaust himself.

Mr. H. L. Taylor, who was Secretary of the Syllabus Committee, appointed by a Conference of Pharmaceutical Faculties and Boards of Pharmacy, at once launched upon a severe criticism of Mr. Wall's paper, and spoke at length in opposition to his views, being at times almost denunciatory in his language. He said he was reminded of a quotation from one of our great American humorists, that "It is better not to know so much than to know so much that ain't so." Referring to the writer's "supreme test" by which the schools should be measured, the test of utility, he was sorry to see "The Western World trying to project upon the Eastern horizon the exploded notions of past decades." The work of education is not utilitarian, it never has been and never can be: it is ideal. Every citizen of this country should take a just pride in the "American System" of education which is ever aspiring and ever climbing upward, and upon which more money, brains and effort are being expended than upon the cause of general education in any other country on the globe. He deprecated any man's coming into an intelligent gathering of people like this, with "these old straws raked together with a muck-rake." He eulogized in glowing terms the public school systems of this country, with their great advantages offered the boys and girls of the land, and said that if the writer's views were to prevail the schools of pharmacy would be relegated to that class of institutions known as "Trades and Commerce Schools," which would mean an intellectual training about equal to that of a boy or girl of fourteen. This, too, in the face of the fact that the law itself implies a much higher standard, in the regulation that the practicing pharmacist must be at least twenty-one years of age.

Mr. Hallberg said that having heard the statistics given by Mr. Wall in his paper, "this attempt on the part of the bureaucracy in charge of our educational affairs" to belittle the writer's statement was not commendable. We have heard too much of this bluff and bluster about the educational status in the United States. The education, so far as public instruc-

tion in this country is concerned, is about on a par with that of the most poverty-stricken country in Europe; in fact, he doubted if it equaled that in some of the Balkan States. No country in the world has the advantages and possibilities for public instruction that the United States has, but, unfortunately, we have patterned too much after the English on this subject. Mr. Hallberg referred to the setting apart in the Western States of every sixteenth section of land in the center of a township for educational purposes, the revenues from that square mile to be devoted to public instruction, and said it was a fact that everywhere valuable land had been frittered away—stolen and appropriated by the leading citizens for mercenary and commercial purposes; and that the youths of the land had been robbed of at least ninety-five per cent. of the money that ought to have come to them for the purpose of general education. In Chicago this sixteenth section in the original township represented a square mile in the very center of the city—the most valuable piece of land in this country, not even excepting Manhattan Island. Now, who is responsible for the poor status of public instruction in this country? There is no reason why the youth of fourteen should not have a grammar school training which would fit him to study the scientific branches; but this was not true by a long shot. In many cities the people who can afford it send their children to the pay schools. They do not send them to the public schools because the instruction is rotten. Mr. Hallberg said he had had experience in this matter, far more than Mr. Taylor, or anyone else, perhaps, on this floor—an experience covering the past twenty-five years. He had conducted for twenty years a system of mail correspondence, and his institution had probably had fifteen thousand youths in training in the study of pharmacy during that time, and he felt that he knew this situation thoroughly. The trouble is we have been too lax. We never find anybody that understands what these educational laws mean. Somebody is responsible for allowing these people to appropriate that valuable land. If Chicago had the revenues from that square mile of land, every child in that city could graduate at a university, because the annual revenue would amount to twenty-five million dollars. Most of this land had been taken up by Marshall Field and other mercenaries. The wonderful possibilities for public instruction through the land laws had been pointed out by President McKinley, and he believed by President Roosevelt also. We want the money, but where we can get some good out of it and indirectly to benefit our pharmacy schools.

In speaking of the poor status of the public instruction in the United States, exception should be made of the New England and Eastern States, in which the public school system, except perhaps in some of the larger cities, is on a stronger basis than in the Central and Western States, but even in the New England States, of recent years the instruction has become demoralized through the great influx of French Canadians, who represent "poor stock" and have had poor educational opportunities.

Mr. Wall, responding to the criticisms made upon his paper, said that some of the gentlemen were like the American who went to Europe and went to see some of their big cathedrals and other great edifices. In each case, however, he could always think of something in America that excelled it. Finally he went to see Mt. Vesuvius in eruption. He was asked what he thought of that. He had to admit that there was nothing in America like it, but said that they had a Niagara Falls there that could put it out in five minutes! Continuing, Mr. Wall made the statement that there were four million five hundred thousand children in the Southern States that did not get any education, not even a primary one, because they had no primary schools. Some of the States in the South are building a school house a day, and yet this great number of her children in that section of the country cannot get the least education, except what their parents give them. These conditions prevail elsewhere also.

The Chairman said he thought the discussion was taking rather an irrelevant turn, and was not germane to the subject before the Section, namely, entrance requirements to the schools of pharmacy.

The Chair then called on Mr. Wolff, of New York, to read a paper which he had prepared on the Second Question, which he did :

WHAT INSTRUCTION DO APPRENTICES RECEIVE IN THE AVERAGE NEW YORK CITY PHARMACY?

BY GUSTAVE WOLFF, PHAR. D.

The scope of this paper is taken from part of Topic 2 tentatively proposed in the "Bulletin of the American Pharmaceutical Association" of August, 1907, page 235. It treats only of the conditions prevailing in the retail pharmacies of New York City since the adoption of the so-called "Prerequisite Law." Those unfamiliar with this law are informed that every apprentice entering our profession must comply with the requirements laid down by the Board of Regents of the University of the State of New York. These are similar to, though not as stringent as, the requirements for the admission of law and medical students. What instruction, if any, the clerks, after having passed through the apprentice stage, receive I will not treat of. The term junior clerk I take to be synonymous with apprentice. Of course I recognize that apprenticeship, in the old sense of the word, has passed into oblivion in most stores of New York City.

The first part of the topic, as found in the bulletin above mentioned, speaks of the education requisite, to make the apprentice a "competent pharmacist." I understand this to mean, capable of being a safe dispenser, guided by the laws of ethics, and capable of successfully conducting a retail pharmacy. Local requirements and conditions, coupled with personal views, may change this definition somewhat. In New York, as in most States, the minimum time required for apprenticeship is four years. Half of this time is spent in a college of pharmacy and half in drug-store

work only. These years of practical work should be preceding the period of time spent in a college of pharmacy. This should be made mandatory by the law, and not be left to the discretion of the apprentice.

Large retail pharmacies having well-appointed prescription departments rarely employ apprentices in this department, except to carry the finished package containing the medicine to the residence of the patient. Neither the proprietor nor the clerk have there, as in most stores, the requisite time, inclination and capacity to properly instruct apprentices. He has to "pick up" everything he learns, and makes slow and incomplete progress. Small stores are better places for the apprentice's training.

The meagre salary paid to the apprentice at the start also has a deleterious influence on the quality of the material offering itself as such.

The many side lines carried in most pharmacies consume a considerable portion of the time of the apprentice. No one claims that the soda-fountain, the cigar and the toilet-goods show-case ever gave an adequate training in pharmacy. In these days of elegant pharmacy there is an ever-increasing sale of toilet articles, elegantly put up by the enterprising manufacturers, spending fortunes in advertising their preparations, as cold creams, tooth pastes, etc.

Menial work necessarily has to be performed in a pharmacy, as the washing and cleaning of shop bottles, fixtures and show-cases. This, however, should be delegated to a porter or a scrub-woman, or else to a boy entering with the distinct understanding that he is not to become a pharmacist, but to remain a porter.

The sweeping of the carpet in the office and the washing of the cuspidor is not considered an element in the training of a budding lawyer who has to serve summonses, copy letters, etc. The employing lawyer in whose office he is studying law does not make him do porter work, and if he would attempt to do so the law student would indignantly refuse to perform such work.

If the apprentice is made of "the right stuff" he can in one-half of the time learn more than the average apprentice does now, if conditions are favorable for his instruction.

This presumes that the proprietor or a competent clerk instructs the apprentice properly. This instruction is woefully neglected in most stores. We can readily prove this by questioning the "boy" in any pharmacy whether or not he makes solution of citrate of magnesia. He will answer that he makes it daily, and that he knows "all about it." You proceed to quiz him about the chemical reaction involved in it. He stares blankly at you, and casually remarks that he will learn all that when he goes to college, and up to that time he will not "bother his brain about it."

The defect counter, on which formerly most, if not all, preparations were made, has disappeared virtually in many pharmacies. The use of fluid extracts, which by dilution are converted into tinctures, is too

often practised, and this has given the deathblow to the last chance of the apprentice to learn something substantial about galencial pharmacy. Most herbs are now bought and sold in pressed packages.

The drug store library, if we may give it this high-sounding name, consisted formerly of a twenty-year-old tattered copy of a Dispensatory, which had lost its index, and a considerable portion of its leaves. To-day all stores have a late edition of such Dispensatory, and most all have a copy of the United States Pharmacopœia. But outside of these two works, most stores own few, if any, scientific works.

A lawyer, keeping an up-to-date law office, possesses a set of the reports of the cases adjudicated by the Court of Appeals of his State. If a retail pharmacist would spend two hundred dollars once, and every year thereafter twenty dollars additionally to keep the library up-to-date, within ten years he would possess a library meeting the requirements of the most exacting.

I think that the Board of Pharmacy owes it as a duty to the apprentices, to issue a list of text books suitable for the preparation of the applicant for examination before them.

If the apprentice finds it too difficult to acquire sufficient knowledge, he often becomes disappointed and does not care whether he makes proper progress. He purchases a few quiz-compends and "crams up." If he passes the examination before the Board of Pharmacy, he forgets faster than he has learned, the little he has learned.

No stimulus in the shape of a further examination prompts him to keep up scientific attainments. There ought to be an additional examination required of the clerk, ten years after he has become a licensed pharmacist, before he is permitted to open a retail pharmacy.

Another handicap to the success of the apprentice in studying, is found in the over-large amount of accommodations furnished by most retail pharmacies to the public gratuitously. We there find a telephone and its stupid and lazy patrons, the street directory and the lady who always forgets her eye-glasses at home, and the girl who insists upon sending a foolish picture-postal-card between seven and eight p. m., when the rush at the prescription and sales-counter is at its height, and the sale of stamps fairly impossible.

Most people, outside of pharmacy, claim that most retail pharmacists are "cranks of the worst sort." But is it a wonder if some are made cranky, by being made the encyclopedia and information and accommodation-bureau of the community?

Meagre pay and long hours and outright slavery, even a disturbed sleep, stares the apprentice in the face. It is no wonder that so many desert our calling before having reached the goal. Not so long ago, I passed through one of the streets of the crowded east side of New York City. I noticed a corner drug store, which had a side entrance, and, as the

weather was hot, this entrance was open. I looked in and noticed that the part of the store containing the side entrance constituted the rear part of the store. The rear part was filled with barrels of camphor balls, boxes of soap, etc., and contained in one corner a curtained-off portion. The curtains, being open, revealed a bed and an enormous electric bell, connected with the night push-button, also an alarm clock. A wash-stand I failed to see, and I assumed that the poor drudge, clerking there, had to perform his daily ablution at the drug store sink.

The low social status of the retail pharmacist in comparison with the high position occupied by the physician and the lawyer has been commented upon.

The remedies for the evils pointed out, consist in earlier closing at night and on Sunday and legal holidays during all but two hours daily, thus shortening the working hours. The spare time of the apprentice during such hours, if there is any such, should be used in studying, and not in delivering telephone messages, stamp selling, etc. The proprietor of the store, or his chief clerk, should set aside at least three hours each week, in which to instruct the apprentice. Memorandums should be kept of such happenings, occurring during the week, as furnish a chance to give instruction and scientific explanations to the apprentice during the hours set aside for this purpose.

This would be very good for the proprietor, in order to "brush up," as well as for the apprentice to acquire knowledge.

Contracts providing for a continuance of the apprenticeship from year to year would be serviceable for the apprentice as well as for the employer. The manufacturing of as many articles as possible would constitute a very valuable instruction for the apprentice in galencial pharmacy.

The gradual purchase of a laboratory outfit and of a set of reagents and of a library is recommended. To the more advanced apprentice urine analysis should be taught. The college course, which the apprentice undertakes, should be lengthened from two to three years, six days a week, forty weeks per year, eight hours a day. The period of apprenticeship should be lengthened from four years to five years. A clerkship of ten years following the apprenticeship should be demanded before the clerk would be allowed to become a proprietor of a retail pharmacy, and his fitness should be proven by an additional examination, to be held ten years after the time when he passed his licenciate-examination or at any such future time as he would see fit to present himself.

The proposed changes are here submitted with the intention that they may arouse criticism and comment. If any part of these would become the custom, I do believe that the lot of the apprentice of the future would be a happier one than the lot of the apprentice of the past and present. As it is supposed to be our altruistic duty to look for the benefit of those who come after us, though we ourselves may not reap any benefits there-

from, I think that something should be done to ease for the future generation the thorny path the apprentice of to-day has to travel.

On motion of Mr. England, the paper was received and ordered to take the usual course.

The Chair called for a paper by Mr. Lowe on the subject of "Pharmaceutical Experience as a Prerequisite to Pharmaceutical Education and Examination," and the gentleman presented his subject as follows :

PHARMACEUTICAL EXPERIENCE AS A PREREQUISITE TO PHARMACEUTICAL EDUCATION AND EXAMINATION.

BY CLEMENT B. LOWE, PH. G., M. D.

Much has been said in recent years about the value and necessity of increased scholastic attainments by those who desire to enter our colleges of pharmacy. The writer is in sympathy with some standard of educational attainments which will certify to the standing of those who shall knock at the portals of our institutions of learning, because as a teacher he knows that a certain amount of learning is an absolutely essential prerequisite on the part of those who receive instruction ; by lack of it the student's power of comprehension is greatly limited and the vocabulary of the professor must also be made quite simple if he is to be understood. He is, however, not in favor of putting the intellectual bars so high that it would result in keeping all but a limited few out of the profession, and possibly the most of even this limited few who could surmount the intellectual barriers would have but little disposition to do so. They would probably say *cui bono* (what good), long hours, Sunday traffic and moderate profits are no inducement for me. I can find elsewhere a more profitable field for my life work. It seems to me that in our efforts to improve the intellectual standing of pharmacy we have put the intellectual cart before the commercial horse, or at least we have been trying to make him draw more than he had strength to. It would have been wiser before making such strenuous efforts to increase scholastic attainments to have waited until by means of the N. A. R. D., or by other economic processes conditions in pharmacy were more favorable.

The United States is finding it difficult at the present time to secure recruits for its army ; rigid requirements for entrance, small pay, fatiguing work, the loss of the canteen, higher pay in the trades, all act as hindrances. The United States by legislative enactments can change the most of these conditions ; law seems to be able to do but little for pharmacy, excepting to oppress it.

An educator of prominence who is a close observer of pharmaceutical conditions, said in my hearing, "Years ago young men believed that the drug business was a profitable calling, you could sell water for fifty cents per pint, consequently many young men went into the business because they believed that their labors would be financially rewarded ; in recent

years there has been so much said about cut prices and the consequent financial demoralization of the business that they have been deterred from entering it, consequently there is a dearth of competent clerks, and from one end of the land to the other the cry goes up, 'give us clerks, give us clerks.' " Do not let us as an Association, advocate a further increase of intellectual standards until our country is able to measure up to those which we have, and by our country we do not mean a few states where conditions are somewhat favorable, but we mean our country as a whole.

We have wandered somewhat from our original intention in writing this article, our first thought was to try and impress upon our hearers the value and necessity of a pharmaceutical experience before taking up the study of pharmacy. Just here we would like to say, that we have not been among those who have decried "correspondence courses of pharmacy" for they have their value, which, while not equal to attendance upon a veritable college of pharmacy where personal contact with the teaching staff counts for much, are much better than no course at all, and are a fine introduction to a course of pharmacy. We are acquainted with several students who were prize winners during their college courses on account of the instruction previously obtained by means of such courses. What we contend for, is the necessity, if one is to get full profit out of his college course, of obtaining some pharmaceutical experience before entering college. It seems to me that in the majority of cases this experience should be not less than one year and it would be better if it were two. If a professor has to lecture to raw pharmaceutical material, his instruction will be limited to the same extent that it would be if his pupils were deficient in an English education.

The writer was applied to some years ago by an apparently intelligent young man from North Carolina, who had unwisely come to college after an experience of only a few months in a country drug-store. He was anxious to work without pay so that he might secure a pharmaceutical experience and thus better understand the lectures, which by reason of their fuller experience seemed perfectly plain to the rest. The writer also knows that those students who take a college course in which experience is not required, repeatedly express themselves as hampered in their studies by lack of a pharmaceutical experience. He has learned that those students who have studied physiology in the public schools (even as frequently taught) comprehend his lectures better than those who have had no previous instruction.

Our pharmaceutical boards consider store experience as an absolutely indispensable prerequisite to examination, in fact, at the present time (excepting in Pennsylvania and New York) it is considered more important than college education, for a degree from a college of pharmacy is not a prerequisite to an examination.

Neither of the pharmacy boards of the two States mentioned, dictate

when that experience is to be obtained, whether before, during, or after the college course. To our mind it is better to have, as we have before indicated, part of the store experience precede the college course ; the rest may be contemporaneous with it.

In talking the matter over with the dean of the department of pharmacy of one of our state universities, he said, "I do not see why a pharmacist cannot get his experience after graduation, the same as a lawyer or physician ; it takes either of them several years to get the necessary experience and they don't amount to much in the mean time." The illustration, however, hardly holds good, especially in the case of the physician. At the present time an immense amount of experience is obtainable during a medical course by means of clinics, hospitals, etc., in fact, a student will not be passed in obstetrics unless he has himself conducted a number of obstetric cases. The fourth year in college is devoted almost entirely to clinical work, that is, bedside instruction.

In the magnificent hospital of Jefferson Medical College, recently opened in Philadelphia, there are no large class rooms, for there is no need of them, the class while under instruction being divided into small squads. The reason of the delay of a young physician in getting into practice is not because he has not had experience, but because it takes time for him to demonstrate the fact, confidence is a plant of slow growth. How many of the successful pharmacists present would want to put their business in the hands of a graduate of pharmacy, even if the law permitted it, if he were destitute of store experience. We contend that a young man who graduates in pharmacy without a store experience will never obtain the same thorough experience that he might have obtained previous to his graduation. He will find it difficult to get a satisfactory position in a drug store, he can't be treated as a boy, and he paid a boy's wages ; yet, by lack of his experience he cannot get a registered position, certificate, or pay. He is neither fish nor fowl, and occupies an anomalous position. The facts are, that most of the departments of pharmacy in our state universities do not turn out pharmacists, but pharmaceutical chemists. A few years ago three graduates of an eastern college of pharmacy that requires store experience as a prerequisite to graduation, went out to Denver, Col., after graduation. They had not been there a week before two of them obtained excellent positions in the best drug stores in the city, the third was given charge of the best pharmaceutical laboratory in the state ; what is still better is, that these positions are still held by them ; these young men did not have to go around begging some one to give them a position in order that they might obtain the necessary experience, for they already had it and could convert it, plus their college course into fine salaries at once. The writer can hardly understand why the question of store experience should have been relegated to the past by quite a number of colleges unless it is more profitable for an institution

not to require it; he was told by the dean of one institution that the doing away with the requirement of store experience in his own college was contrary to his best judgment, but they were compelled to keep pace with a rival and hence the action. The value of a thing is sometimes proven by efforts which are made to imitate it. The dean of a department of pharmacy advocated the acquirement by the college of a line of druggists' sundries so that the students (with no store experience) could learn something about them. A clerk in a good pharmacy would learn more about such a line in three months than he could in a college of pharmacy in three years. We would like to present a little different light of the subject. Last year at Indianapolis a prominent New York educator appeared before the executive committee of the Conference of Pharmaceutical Faculties and made a plea on behalf of certain pharmaceutical colleges of his state which found themselves unable to comply with the requirements of the conference as to laboratory hours, that they be given three years to reach the required standard; in the meantime, as one of these colleges required store experience before graduation, that the students of that college be given some credit for that store experience in lieu of the wanting laboratory hours. To my mind there was considerable fairness in the request and those colleges which require store experience as a prerequisite to graduation should be given some credit for it, not perhaps hour for hour, but possibly two for one. The writer last winter employed a student whom he kept the most of the time at the prescription counter, as he had had a previous experience of seven years in a drug store situated in a large city of the state. It was said to him that the experience which he was getting, was more valuable compensation than the wages he was being paid, and he wisely recognized it. This experience practical and valuable as it was, did not count for even a fraction of time of the required laboratory hours.

I am aware that those colleges which do not require store experience as a prerequisite to graduation are said to base their action on the ground of being unable to certify to the character of the experience. It can be readily granted that there is a difference in store experience, just as there is a difference in high schools, one year in some high schools being of much greater value than in some others, but any store experience is better than none. Excellent experience, however, can always be had if some care is taken by the embryo pharmacist or his parents to look into the matter; in every town there are always drug stores that have a reputation for giving their apprentices a fine opportunity, and conversely the reputation of these stores ought to give them an opportunity for selecting the better class of young men.

In conclusion I would say, that nothing that I have written is to be construed as in opposition to college education. It has been taken for granted that every wide-awake young man will both want it, and get it; I have

simply tried to emphasize the value of some store experience as a prerequisite to a pharmaceutical education, and the great advantage of acquiring the rest of the necessary store experience before graduation.

Mr. Lowe also read a paper on the subject of the abolition of the apprenticeship system, which he said he had prepared at the request of the chairman :

DISCUSSION ON THE ABOLITION OF THE APPRENTICESHIP SYSTEM
AND THE SUBSTITUTION FOR IT OF PHARMACEUTICAL SCHOOLS.

BY CLEMENT B. LOWE.

Prof. Oldberg, the Chairman of this Section, has kindly invited me to open the discussion on Question 3 of the printed program. He has not dictated to me in any way how I should consider it, or what I should say.

First, I think that we are all agreed that the old apprenticeship, as it once existed in the old country, especially in England, when a young man paid for the privilege of learning and had a right to expect a certain *quid pro quo*, has passed away. It is a question whether these conditions ever existed in this country, excepting to a limited extent. Seventy-five or one hundred years ago a young man desiring to learn the drug business would sometimes have much trouble in securing an opportunity. He would probably be paid \$50.00 the first year, with a raise of \$25.00 or \$50.00 for each succeeding year of his apprenticeship. In return for his services, his employer was supposed to impart more or less instruction, the amount depending largely on the amount which he possessed, and his ability to impart it; some of the pharmacists of those days acquired quite a reputation for turning out a superior class of young men. At the present time a young man who desires to learn the drug business no longer binds himself to stay for a certain number of years, neither does the proprietor pledge himself to keep him. In quite a number of cases there is an agreement as to wages, length of service and college privileges, but it is generally one of honor only, no papers being given.

I think I shall have to disagree with the first premise in this question, that is, that the apprenticeship system has ceased to exist in many of the trades, because I know from personal knowledge that it is still in existence, but in addition some of the trades have wisely instituted trade schools where much excellent instruction is given. In addition there are institutions such as the manual training schools of the different cities, where the mind and hand are trained at the same time, so that the graduates of these schools are enabled to take advanced positions at better salaries than they could otherwise have obtained. None of these schools turn out full-fledged journeymen: there are many things the theory of which can be learned in schools, but the skill which is necessary for their best performance can only be acquired by actual practice under every-day business

conditions. It goes almost without saying that the young man who has had a technical education in addition to a manual training will be able to achieve a greater success. It might be said in passing, that one of the causes which led to the founding of some of the trade schools was the arbitrary action of some of the labor unions, who with a view of keeping down the supply of workmen, so that a high wage should be maintained, forbade more than a limited number of apprentices. I have been told that in some cases an employer was not able to teach his son his own business. I am in agreement with the statement that increased efficiency can be attained by means of these trade schools, just as many a young man has found the instruction advantageous to him which is now so largely given in the Y. M. C. Associations throughout our country. But no school of carpentering ever undertakes to teach all that a carpenter ought to know; you can't build a building in a school-room, excepting in imagination; just so, no school of pharmacy can imitate or teach in its laboratory courses all of the actual conditions of business life; there are a thousand and one things that can only be learned in the actual experience of the store. Many colleges of pharmacy give excellent courses in prescription dispensing of which I highly approve, but if that were all of the prescription experience which a young man obtained, he would hardly be considered an expert. Certain type prescriptions are compounded in the college laboratory, the student is told why he should do or not do certain things; the knowledge thus acquired must be applied in the routine of daily life. Can any college train a young man to become an expert in prescription reading such as an experience in many stores would do.

In conclusion I would say that I am heartily in favor of practical laboratory courses in colleges of pharmacy, not for the reason that they can take the place of store experience, but because they are supplemental to it and give a young man a wider view of his intended profession.

The Chairman said there were two committee reports ready, and called on the Secretary of the Syllabus Committee appointed by the National Association of Boards of Pharmacy and the Conference of Pharmaceutical Faculties, to give to this Section the substance of his report rendered to those bodies at this meeting. Continuing, the Chairman said that this Association stood for progress and education and the betterment of all conditions of pharmacy. It stood for agreement between the schools and boards, and last year had adopted resolutions along these lines. The Syllabus Committee had been appointed to prepare a syllabus or course of study for pharmaceutical schools to indicate at the same time the scope which examinations for license might take, and it was for these reasons that he desired to call on the Secretary of that Syllabus Committee to state briefly what had been done so far.

Thereupon Mr. H. L. Taylor, Secretary of the Syllabus Committee, read the following report:

REPORT OF THE SYLLABUS COMMITTEE.

To the Section on Education and Legislation of the American Pharmaceutical Association, New York, September 4, 1907 :

On formal motion, the National Syllabus Committee, representing the Boards and Schools of Pharmacy, outlining a minimum course of study for the guidance of pharmacy schools and State Boards of Pharmacy, voted that the definitions as amended at the sessions of September 3, 1907, be presented to the American Pharmaceutical Association with a view to their publication.

The wide discrepancy in the use of pharmaceutical terms in the dictionaries and in the announcements of schools and in the examinations of State Boards, make it apparent that formal definitions are necessary as a basis for the syllabus.

This necessity early appeared in the work of the committee, and the Secretary collected definitions of terms included in the syllabus outlining a minimum course from general and medical dictionaries for the consideration of the Committee in May, 1907. He took advantage of his contact with the various members of the Committee as he met them after sending out the study on definitions in May, to make a careful revision of the same that from the study might spring proper definitions and a logical modern vocabulary for use in the syllabus. At the session of the full Committee last night these definitions were carefully considered from the standpoint of the boards of examiners and the instruction in the schools. They were revised, amended and ordered printed for suggestions, corrections and emendations by all interested in the cause of pharmaceutical education.

DEFINITIONS.

In words as fashions the same rule will hold,
Alike fantastic if too new or old,
Be not the first by whom the new are tried,
Nor yet the last to lay the old aside.

College and School : The term College includes universities and other institutions of higher instruction authorized to confer degrees in arts and sciences. Professional and technical institutions are uniformly called schools, whatever their corporate titles; hence the word "School" in this work will refer uniformly to colleges or schools of pharmacy or departments of universities.

Pharmacology : The sum of scientific knowledge concerning drugs and medicines; their nature, preparation, administration and effect, including pharmacognosy, pharmacy pharmaco-dynamics and therapy dynamics.

Drugs : All substances used as medicines or in the preparation of medicines. Drugs that have not been changed by manufacture except by desiccation or comminution.

Medicine : A drug or preparation of drugs possessing or reputed to possess curative or remedial properties.

Materia Medica : Treats of the physical, physiological or therapeutical properties of the materials used for curative and remedial purposes.

Microscopy : The art of examining objects with a microscope.

Physiology : Treats of the organic functions in a state of health.

Botany : Treats of the structure, growth and classification of plants.

Toxicology : Treats of poisons, their recognition, effects and antidotes.

Dosology : Treats of the doses of medicines.

Pharmaco Dynamics : Treats of the actions of medicines on healthy organs.

Therapy Dynamics : Treats of the actions of medicines on diseased organs.

Pharmacognosy : Treats of the identification and selection of drugs.

Histologic Pharmacognosy : Treats of the microscopic structure of drugs.

Commercial Pharmacognosy : Treats of the trade and commerce in drugs.

Chemistry : The science of the composition of material things and the art of determining such composition.

Physics : The science of the properties and forces of matter.

General Chemistry : Treats of the theory and principles of chemistry.

Pharmaceutical Chemistry : Treats of the chemistry of remedial and curative substances.

Manufacturing Chemistry : The production of chemical substances.

Inorganic Chemistry : Treats of those substances that do not contain carbon in a combustible form.

Organic Chemistry : Treats of compounds containing carbon in a combustible form.

Analytical Chemistry : The art of determining the chemical composition of substances.

Qualitative Chemistry : Determines the constituents of a substance.

Quantitative Chemistry : Determines the amounts of the constituents of a substance.

Assaying : Determines the amount of the valuable constituents of substances.

Pharmacy : The science and art of preparing, preserving, compounding and dispensing medicines.

Pharmaceutical Arithmetic : The arithmetic pertaining to the science and art of pharmacy.

Pharmaceutical Latin : The Latin pertaining to the science and art of pharmacy.

The Theory of Pharmacy : The exposition of the principles on which pharmaceutical operations are based.

The Practice of Pharmacy : Systematic exercises in pharmaceutical operations.

Dispensing Pharmacy : The extemporaneous preparation or compounding of medicines.

Manufacturing Pharmacy : The preparation of pharmaceutical substances.

Pharmaceutical Jurisprudence : The relations of law and pharmacy to each other.

Commercial Pharmacy : Trade or commerce in pharmaceutical products including business practices.

Please mail all criticisms, suggestions, corrections or emendations to Henry L. Taylor, Secretary National Syllabus Committee, Education Department, Albany, N. Y.

Mr. England moved to receive the report just read and refer for publication, and the motion was seconded by Mr. Sayre and carried.

The Chair called on the Secretary to read the report of the Committee on Chairman's Address, which Mr. England did, as follows :

REPORT OF THE REFERENCE COMMITTEE ON THE ADDRESS OF THE CHAIRMAN OF THE SECTION ON EDUCATION AND LEGISLATION.

The Committee begs to express its satisfaction with the able manner in which the principal issues before this Section were presented. It approves of the recommendation contained on the address "that the By-laws be amended so as to provide for the election of a secretary of the Section who shall serve from year to year as long as his services are efficiently performed" etc., with the conditions suggested in the address.

Respectfully submitted,

C. S. N. HALLBERG, *Chairman*.

W. M. SEARBY,

HENRY P. HYNSON.

Mr. England moved to accept the report as read.

The Chair stated that of course it was to be understood that the recom-

mendation of the committee, if adopted, would involve a change in the By-laws, and would have to be referred for action next year.

Mr. Hallberg expressed the opinion that the matter should go to the Committee on Reorganization, and Mr. Mayo moved to amend the motion made so as to receive and adopt the report and refer it to the Committee on Reorganization, as suggested. This motion was seconded by Mr. Anderson and carried.

The Chair said the next subject of discussion was upon question No. 4, and that the discussion on this question was to be lead by Mr. James H. Beal, of Ohio. Said question was as follows :

"What should be the general character of the questions asked in State Board examinations in pharmacy? Should any questions be used which call only for a good, well freighted and refreshed memory, with or without any other mental power? To what extent can questions be used which cramming will not enable any one to answer, but which test the efficiency of the examinee and can be easily answered by any one possessing a moderate amount of the real knowledge of chemistry, pharmacology and pharmacy, acquired by a reasonably good course of systematic study?"

Mr. Beal was not present, and the Chair said that the question was before the Section for action. On motion of Mr. Hallberg, the matter was passed for the present.

The Chair read the sixth proposition for discussion :

"What are the best methods of teaching students of pharmacy in each of the principal branches included in the curricula of the pharmaceutical schools?"

Mr. England moved to postpone consideration of this question until next year.

The Chair expressed himself as thinking it hardly desirable that this question should be passed so lightly, as it was one that could properly occupy the time of the Section for a few minutes. He said Mr. Whelpley and Mr. Hallberg were booked to lead the discussion.

Mr. Whelpley was not present.

Mr. Hallberg stated that his contribution to this question would simply be a reference to a certain method which he had pursued for the past eight years in teaching in his college. He had found that it consumed a great deal of time to prepare the syllabus on the blackboard—the handling of the charts, etc.—and it had occurred to him to have a note-book for the student and have a syllabus of the lecture printed on the left-hand page, leaving the right-hand page blank. (Mr. Hallberg here exhibited to the members a copy of the book he used.)* The student would put down his reference in the blank space, and in the evening he would devote

* These books come in sets of three, including one for laboratory work, and may be procured from Prof. C. S. N. Hallberg, Mich. Bl'vd. & 12th st., Chicago, Ill., for \$1.50.—
The General Secretary.

half an hour to a review of the particular subject from the text-books, and then would write out a short thesis in his own language on this blank page. The only objection to the original form of the book was that it made it too easy for the student. In the last edition of this book he had eliminated the physical constants and things of that kind in order that the student might insert them himself. He thought that was an improvement. He had purposely left these things out that the student might add the solubility, specific gravity, etc., and also the percentage of strength of certain preparations.

The laboratory work was formulated on the same plan. Working with the Pharmacopœia as a text-book was exceedingly difficult and trying. Take, for example, compound syrup of hypophosphites; the process is very elaborate, and rather difficult to follow, especially when 100 Cc. is made—the usual quantity that the student prepares of a preparation of that kind. The Pharmacopœia formula being based on 1000 Cc. makes it very difficult for the student to follow. Mr. Hallberg went into some detail in comparing the elaborate directions and processes of the Pharmacopœia with the much simpler and shorter one used by him in his book, and concluded by saying that he had found his plan to be one of great convenience, and he offered it here simply as a suggestion to those interested.

The Chair stated the substance of a paper by Paul J. Waldner on the subject of "Pharmaceutical Service in the United States Navy," and the paper, on motion of Mr. England, was received and referred for publication. The full text of the paper here follows:

PHARMACEUTICAL SERVICE IN THE UNITED STATES NAVY.

BY PAUL J. WALDNER,
Pharmacist, U. S. N.

It is not generally known that there is a large field for trained young druggists in the naval service, and I believe that the American Pharmaceutical Association could give this matter some publicity, and possibly make the service more attractive by co-operating with the Bureau of Medicine and Surgery of the Navy Department in its efforts to improve the Hospital Corps. The Hospital Corps consists of hospital apprentices, hospital apprentices first class, hospital stewards, and pharmacists. Pharmacists are appointed from the class of hospital stewards in the order of their length of service, and after a rigid professional examination, and as the hospital steward does most of the pharmaceutical work on board ship, it is highly desirable that he should be a well-trained druggist. The pay of hospital stewards is as good and in some respects better than that of drug clerks in civil life, and the work and hours are lighter, and the chances for saving money and for study are very good. The Surgeon-General of the Navy is desirous of having young men from the colleges of pharmacy join the Hospital Corps to fill vacancies in the rating of hospital steward, and is

doing his utmost to make the service so attractive as to induce young men to choose it as a career in view of the fact that they are eligible to the grade of pharmacist, which is an honorable and well-paid position assured during good behavior. Conditions in the Hospital Corps to-day are far better than formerly, and we have reason to expect still more improvement if Congress enacts the legislation which the Navy Department will recommend at the coming session, and which will give the hospital steward the same pay as is allowed other chief petty officers; increase the number of pharmacists so that more rapid advancement will be provided, and give to pharmacists the right to promotion equal to that of the warrant officers of the line. This, as stated before, all lies with Congress, and as the A. Ph. A. was actively at work with the Bureau of Medicine and Surgery in 1898, when the original bill creating the Hospital Corps was enacted, it could no doubt do a great deal now to bring it in line with the general trend toward advancement, and to improve upon the conditions provided by that bill by making representations to the Senate and House Naval Committees, requesting favorable consideration of the measures designed to equalize the pay and promotion of members of the Hospital Corps with the corresponding personnel in the line. It would be very desirable to have the various colleges of pharmacy call the attention of the students to the good field which exists in the naval service for bright young men. The Bureau of Medicine and Surgery of the Navy Department will be glad to furnish information regarding the Hospital Corps to all who may apply:

The Chair called attention to an interesting paper by Mr. England, the Secretary of the Section, on the subject of the "Administration of Pure Drug Laws," and remarked that after the chairman had gotten in his "deadly work," and had done everything he wanted to do, it was naturally quite easy for him to consent that somebody else's paper should be sacrificed for the general good—as in Mr. England's case. He nevertheless invited Mr. England to state the substance of his paper. Mr. England, however, said it would be impossible to give even a brief synopsis of his paper, owing to its length and peculiar character, and he would prefer that it would simply be read by title and referred for publication. Mr. Anderson so moved, and the motion prevailed.

The full text of the paper here follows:

THE ADMINISTRATION OF PURE DRUG LAWS.

BY JOSEPH W. ENGLAND.

There is a strong tendency on the part of many State Legislatures to place the administration of pure drug laws in the hands of State Boards of Health rather than in the hands of those having drug knowledge, such as Boards of Pharmacy. This preference has been shown by California, Colorado, Delaware, Indiana, Kansas, New Hampshire, New Jersey, South

Carolina and Tennessee ; and also for the Commissioner of Agriculture, as in Florida, Georgia and North Carolina ; for the Food Commissioner, as in Washington ; for the Dairy and Food Commissioner, as in Oregon and Texas ; for the Prosecuting Attorney of each county, as in West Virginia ; and for the Agricultural Experiment Station, as in Maine. In one State only (Iowa), so far as the writer can learn, was pharmacy recognized, and in this State the pure drug law, passed on April 6, 1907, was placed under the executive control of three Pharmacy Commissioners.

Now, why are the State Boards of Pharmacy so persistently and almost unanimously ignored in this matter? The answer is probably to be found in the aggressiveness of the State Boards of Health, and other bodies, and the non-aggressiveness of the usual State Boards of Pharmacy.

In addition, many of the pure drug laws are combined in one bill with pure food laws, and that the executive control of such laws has been placed in the hands of State Boards of Health, can only be explained apparently on the ground of political influence. Logically, if the control of such laws is not to be given to Boards of Pharmacy, it belongs much more properly to the Food Commissioner than to the Board of Health.

There is a possible significance in the fact that the membership of the State Boards of Health in California, Colorado, Delaware, Indiana and Kansas is, in every instance, *entirely* made up of physicians, and in New Hampshire, New Jersey, South Carolina and Tennessee, it is in every instance made up of a *majority* of physicians ; and in all these States, the Pure Drug Law enacted has been placed under the control of State Boards of Health. Physicians are usually very active in legislative matters affecting the public health, and until a recent period have had, as a rule, little or no sympathy for pharmaceutical representation in matters of legislation.

State Boards of Pharmacy know, as all pharmacists know, that the administration of a Pure Drug Law requires technical knowledge of an unusual character ; and that such a law can be best administered only by those skilled in drug-matters and not by those who know little or nothing of the subject. It is unfortunate in more ways than one, that State Boards of Pharmacy, generally, have not been more aggressive, in the past, in prosecutions for the adulteration of drugs under the pharmacy laws, and that they have been so has been due to the lack of sufficient funds.

As an illustration of the results of an aggressive policy, by a Board of Pharmacy, the writer would quote from a letter received from Mr. Warren L. Bradt, Secretary of the Middle Branch of the New York State Board of Pharmacy as follows :

"Replying to your question of the enforcement of laws relating to the adulteration of drugs, and as to the tendency to transfer this work to the State Board of Health, and asking how this tendency may be checked would state, that my opinion, based upon seven (7) years' experience as Secretary of the New York State Board of Pharmacy, is that the most

effective way to have the examination kept in the hands of the Board is to have the Board do all of the work along these lines it can. Several bills were introduced in the present Legislature along the lines of the National Pure Food and Drug Law whereby the examination of drugs would be taken from the Board of Pharmacy and given to the Department of Health. The Board of Pharmacy and the State Association vigorously opposed these measures, claiming that the Department of Health had not within the past 8 or 10 years made any collection or examination of drugs, as the State had failed to make an appropriation for this work. In this respect, I do not believe New York State differs from any other, as the legislators all seem to object to appropriating money for this class of work, while the Board of Pharmacy showed that in the past four (4) years it has collected and examined 11,500 samples, and last year (1906) 3,554.

"We showed also, that the percentage of adulterations had been reduced from about 40 per cent. to something less than 11 per cent. The Department of Health was fully conversant with the work this Board has been doing, and the good results it has attained without any cost to the State, we receiving no funds whatever through legislation; and asked that the work be continued along these lines.

"I doubt if any State Board of Health will take up and perform the work as vigorously as the State Board of Pharmacy should do, and if they failed to do it through lack of funds, I believe the Pharmacy Law should be amended so that sufficient money from registrations should be provided for the carrying on of this work."

Now let us look at the other side of the picture. The writer has received the following letter from Mr. George C. Dickman, secretary of the Eastern branch of the New York State Board of Pharmacy:

"I believe that only Boards of Pharmacy should be empowered to enforce the laws relating to the adulteration of drugs and such as relate to the sale of drugs, poisons, etc. Boards of Health and Agricultural Boards as a rule do nothing when such powers are given them. Or if anything is done it is done in such harsh manner that the laws fall into disrepute. Example: Soon after the press in our city raised a hue and cry about the 'indiscriminate sale of cocaine and preparations containing this,' alleging that pharmacists in general were guilty of such a practice, our local health board promulgated an ordinance prohibiting the sale of cocaine and preparations containing it, except upon order of a duly licensed physician. The facts are that only a very few of our pharmacists were guilty of the practices charged, and these few were being rapidly brought to terms by our Pharmacy Board. Now, how did the Board of Health proceed to enforce its ordinance? Was it enforced in such manner as would have resulted in benefit to the public? The following instance will show just what was done: Inspectors of the Board of Health collected from a number of our pharmacists such articles as mentholated throat tablets containing $\frac{1}{10}$

grain of a cocaine salt, and then proceeded to hail the *criminals* before a police magistrate, who could do nothing but hold the accused for trial before the court of special sessions. It is not at all alleged that the article in question is a 'habit-producer,' the alleged violation being the sale of a preparation of cocaine. The primary object of the Health Board ordinance was to abolish the traffic in cocaine in such form as would lead to the formation of a habit. It will therefore be seen to what extremes our local authorities resorted in the *protection* of the public. A warning to discontinue the sale of these tablets would in each instance have sufficed, and criminal proceedings were entirely uncalled for.

"I do not believe that it would be wise to create Boards of Pharmacy as an adjunct to the Health Boards unless such Pharmacy Boards can be created by the pharmacists themselves, perhaps through the medium of their State Associations. Otherwise I am afraid that the salary which would have to attach itself to such office, and the funds at the disposal of such a Board, would make fine pickings for the politicians."

The writer has received, also, a letter from Mr. W. R. Ogier, of Columbus, Ohio, who for twenty years has meretoriously served the State of Ohio as Secretary or Clerk of the Ohio State Board of Pharmacy, and who has been rewarded for his fidelity by being refused a re-appointment this year; the letter is an unofficial one, and reads:

"The Ohio laws relating to the adulteration of drugs are placed with the Food and Dairy Department. The Board of Pharmacy is charged only with the administration of the pharmacy law, and this embraces simply the practice of pharmacy, that is, the examination and registration of candidates to practice pharmacy, and the enforcement of the provisions of the act requiring that drug stores must be under the supervision of registered pharmacists.

"The Food Commissioner is elected in the general elections for state officers, and with one exception has been a farmer since the law creating the department was enacted a good many years ago. It will at once occur to you that the situation is anomalous when a farmer is charged with the duty of providing the people with pure drugs, although with one exception, the pharmacists of the state have fared reasonably well under this sort of administration. But there is no guarantee that the future will prove satisfactory, since the people are liable to elect any sort of an individual to a political office.

"It is my opinion that all laws relating directly to the practice of pharmacy should be administered only by boards of pharmacy, and while state boards of health may be an improvement on the granger plan, yet they are far from ideal officers for such service as should be given the public for securing pure drugs. The trouble in Ohio, as perhaps in other States, is that rarely can boards of pharmacy secure such legislative appropriations as will enable these boards to properly administer the law, while boards of

health and departments controlling foods do not have such difficulties to contend with. Doubtless there are too many boards and departments connected with all our state governments, many of which might be economically and wisely consolidated, and I would look with favor upon a state bureau of pharmacy under the Department of Health or Foods which should be under the supervision of pharmacists, and which should have charge of all laws in any manner connected with the practice of pharmacy. This plan might secure proper funds from the state through the department which already is generously supported by the state for carrying on the work in a satisfactory manner."

The keynote of the situation is probably to be found in the statement of Mr. Ogier, that "boards of pharmacy can rarely secure such appropriations as will enable the boards to properly administer the law."

It is a great mistake to regard a pharmacy law as being intended for the benefit of pharmacists only. It is nothing of the sort. The enactment of such a law is police legislation, and the only excuse for police legislation is protection of the public against incompetency in the pharmaceutical service. If, incidentally, pharmaceutical education can be improved, so much the better for pharmaceutical service, and, of course, indirectly for the public, but, primarily, the intent of the law is protection to the whole public, of which pharmacists form but a very small part.

This, then, should be the slogan of pharmacists with legislators: "The state should protect the sick against the dangers of incompetent pharmaceutical service; and the state (not the pharmacists) should pay for that protection by specific appropriations."

What an imposition it is to tax one element of the public to pay for protection to all; and this is exactly what is done by requiring that all the running expenses of the boards of pharmacy shall be paid out of the fees received from examination and licensure. No specific appropriation is allowed, but if the pharmacists of the state want legislation to protect the general public, they must "pay the freight," not the state.

This has been the spirit of the past. There is the dawn, however, of a better day. Since the passage of the federal food and drugs act, and also, state legislation along the same line, the public has become mightily interested in the necessity of having pure foods and pure drugs, and has become perfectly willing to stand for appropriations to this end; and your legislators are ever ready to meet a public demand that is sufficiently strongly expressed.

In addition to the absence of specific appropriations for work, another bad feature of the usual State Pharmacy Law is, in the writer's judgment, the fact that the members of the State Boards of Pharmacy are not paid stated salaries, but only per diem wages for days of actual service. This system is radically wrong. The laborer is worthy of his hire, whether he be a farmer or a pharmacist. The state cannot get the best service unless

it appeals to the best men ; and it cannot appeal rightly to the best men unless it offers an adequate wage, or if it does appeal, and the best men do respond—as many, very many, of our most able pharmacists have done, at considerable sacrifice to themselves—then the state has asked a personal sacrifice that in common honesty, it has had no right to ask. The state should pay for its own protection, and if it cannot afford to pay, then it has no right to ask the pharmaceutical profession to assume the burden. If the state cannot afford fair salaries to the usual five members of its State Board of Pharmacy, then it should follow the example of the State of Iowa, and have three Pharmacy Commissioners, with a Secretary-Treasurer (who cannot be a member of the Board) ; though even this state misses the real point of issue by paying its Secretary-Treasurer a salary not exceeding \$1800 a year, and its Commissioners \$5.00 a day for each day actually engaged in official duties, both payments to be made from the fees received.

Undoubtedly, there are certain advantages in a concentration of work along several lines, if a proper division of responsibility can be made. The ideal method of administering pure food and drug laws in the States would seem to be through a Pure Food and Health Commission and Department, to be composed of a Dairy and Food Commissioner, three Health Commissioners (in place of the State Board of Health), three Drug Commissioners (in place of the State Board of Pharmacy), and the Governor, Attorney General and Commissioner of Agriculture, as *ex-officio* members. The Dairy and Food Commissioner should have, of course, jurisdiction over dairy and food products ; the Commissioners of Health over matters of hygiene and sanitation, and the Commissioner of Drugs over drugs, and the examination and licensure of applicants for pharmaceutical practice. In this way the food and health service of the States should be economically and effectively administered by salaried commissioners especially qualified for the work, while specific appropriations from the States could be more readily procured than now, and prosecutions by the attorney-general more readily obtained.

The Chairman stated that he would try to get the editor of the "Bulletin" to publish this paper at an early date, because Mr. England had sacrificed himself to others who had had a great deal to say at this meeting. Mr. Hynson so moved, and the motion was seconded by Mr. Searby and carried. Mr. Hallberg said the editor of the "Bulletin" was at the service of the Association.

The Chairman stated that the installation of officers was the next order of business, and called on President-elect Searby and Mr. Wolff, of New York, to conduct the newly elected Chairman to the rostrum to be installed. These gentlemen performed this office, Mr. Searby introducing Mr. England. Mr. England said the hour was late—a quarter to six—

and he would simply say that he was deeply sensible of the honor conferred on him in being selected for presiding officer of this Section for the coming year, and he would endeavor to justify the confidence of the members.

Mr. LaWall, the Secretary-elect, was absent, as were also all three of the Associates-elect.

Mr. W. L. Cliffe, of Philadelphia, was asked to act temporarily in the place of the Secretary-elect, and Chairman Oldberg surrendered the gavel to him. Mr. Hynson gracefully stated in introducing Mr. Cliffe that he hoped he was introducing the permanent Secretary of this Section that the members had heard so much talk about. Mr Cliffe made a suitable response, and assured the Section of Mr. LaWall's ability, and vouched for the good work that he would do in the office of Secretary. He promised that he would be entirely satisfactory in that place.

Mr. England here took the chair.

The General Secretary made announcement of the two meetings of the Commercial Section simultaneously with the meetings of the Scientific Section on Thursday morning and Thursday afternoon.

On motion of Mr. Lowe, the Section then adjourned.

MINUTES OF THE JOINT MEETING
OF THE
National Association of Boards of Pharmacy
AND THE
American Conference of Pharmaceutical Faculties.*

THURSDAY, SEPTEMBER 5, 1907, 8 P. M.

Mr. W. A. Puckner, Chairman of the Executive Committee of the American Conference of Pharmaceutical Faculties, called the meeting to order.

He stated that the Executive Committees of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties were instructed by the Joint Conference of 1906, held at Indianapolis, to arrange for the Joint Conference of 1907 and to prepare a program. He further stated that the Chairman of the Executive Committee of the National Association of Boards of Pharmacy, Mr. F. B. Lillie, had requested him to call this meeting to order. He then read the program prepared in accordance with the instructions given by the Joint Conference of 1906, as follows :

1. In view of the fact that the pharmacy laws do not in any case indicate the kind and amount of educational preparation required for the practice of pharmacy, but simply provide that candidates shall be examined, thus leaving the whole question entirely to the discretion of the pharmacy boards: Is it the duty of the board of pharmacy, representing the State, to prescribe and publish in definite terms the minimum educational requirements deemed necessary to render the conduct of the retail drug business safe to the public ?
2. In what form and to what extent should the necessary educational requirements for license to practice pharmacy be published by each State board of pharmacy for the information of persons desiring to follow that occupation, and for the guidance of pharmaceutical schools ?
3. What several distinct subjects should be included in the State board examinations ?
4. How can candidates best prepare themselves for these examinations ?
5. Are courses of education in schools of pharmacy necessary or valuable ? If so,

* The report of this joint meeting is printed in the Proceedings by authority granted by the Association at-large at the request of the Council (see page 94).—*The General Secretary.*

what practical and efficient means may be properly employed to encourage such education ?

6. What can be done to improve the efficiency of the schools of pharmacy ?

F. B. LILLIE,

Chairman Executive Committee National Association of Boards of Pharmacy.

W. A. PUCKNER,

Chairman Executive Committee American Conference of Pharmaceutical Faculties.

Mr. Oldberg nominated for permanent Chairman of the Conference Mr. Frederick A. Hubbard, of Massachusetts, President of the National Association of Boards of Pharmacy.

Mr. Hubbard expressed, on behalf of the members of the Boards of Pharmacy, the desire to listen rather than to take the lead in the discussions, and hoped that someone else would be selected as chairman.

Mr. Oldberg stated that the members of the Conference of Faculties appreciated the fact that the Boards of Pharmacy who have in charge the execution of the pharmacy laws, and therefore have more authority than the schools, ought certainly to take charge of any conference on education and legislation. He believed that he expressed the wishes of all the teachers in saying that they would be pleased to learn what the boards would like to have the colleges do, and hoped that Mr. Hubbard would not decline the chairmanship.

MR. WHELPLEY: In seconding the nomination of Mr. Hubbard, I desire to say that Mr. Hubbard has proven himself a most excellent presiding officer in the meetings of the Association of Boards and that the Boards and Faculties would derive mutual benefit from his acceptance of the chairmanship.

Mr. Anderson moved that the nominations be closed, which motion was seconded and carried.

Mr. Oldberg moved that the temporary chairman cast a ballot for the election of the nominee, which was done.

Mr. Puckner then introduced Mr. Hubbard, who took the chair.

Mr. F. B. Lillie nominated Mr. Puckner as secretary of the Joint Meeting, and he was elected.

The chairman requested the secretary to read any communications addressed to the Joint Meeting, and the following resolution adopted by the California College of Pharmacy was presented :

Resolved, That in any consideration of the matter of preliminary education which may come up at the Joint Meeting of Boards of Pharmacy and the Pharmaceutical Faculties, we instruct our delegate to urge that the qualification demanded by the Conference of Pharmaceutical Faculties be adopted by the several State Boards as their standard of preliminary education.

This resolution was signed by W. M. Searby, President, and H. B. Carey, Secretary of the Faculty.

The communication was received and consideration deferred until this

subject should be reached on the regular program. The chairman then called up the first question raised by the program prepared by the Executive Committee. The chairman called upon members present to express their opinions.

MR. SEARBY: It is eminently proper that all State Boards should let it be known that any young man who wishes to become a registered pharmacist or a registered assistant pharmacist should have a certain amount of preliminary education. He related the efforts of the California Board of Pharmacy to establish a minimum standard in that State. He referred to the fact that educational facilities are not equal in different States. He then moved: It is the sense of this Joint Conference that wherever it is practicable the State Board of Pharmacy should insist that persons coming to be examined for licenses as apprentices, assistants or pharmacists should produce evidence of at least a completed grammar school education.

The Chairman expressed the hope that this important question be thoroughly discussed before the motion was put to vote.

MR. BOND: The idea of establishing a definite standard of preliminary education meets with my hearty concurrence. I have been President of the Arkansas Board of Pharmacy for the past fourteen years and am still connected with that Board. In Arkansas we require candidates for license to produce certificates from superintendents of high schools, or county superintendents, or the State examiner, showing a preliminary education equal to that required for admission to a graded high school. We also accept as satisfactory evidence certificates of county examiners authorizing the holder to teach school. The caliber of candidates for license in Arkansas has greatly improved during the last three or four years on account of the greater attention given by the Board to the preliminary education.

THE CHAIRMAN: Is there any law in Arkansas bearing upon this subject?

MR. BOND: No, sir. The State law gives the Board ample discretionary power. The Board of Arkansas fixes the term of practical experience as well as the preliminary education, and the length and scope of the examination are also left to the Board.

THE CHAIRMAN: Has the question ever been raised in your State holding that the Pharmacy Law is class legislation?

MR. BOND: No, sir.

MR. GIETNER: I will ask Dr. Bond if there are any other requirements aside from the grammar school education demanded by the Arkansas Board?

MR. BOND: Yes; the candidate must be twenty-one years of age; he must have had three years' experience in drug stores. Our rules are published, and all candidates know what they are up against.

MR. GIETNER: In Missouri all that the Board requires is grammar school education. The candidate must know how to read and write and must have a good common school education. Three years' actual experience in a retail drug and prescription store is required; not experience in a patent medicine or grocery store, but where prescriptions are compounded.

MR. WALL: Mr. Chairman, I believe that the wording of the motion before us

should be changed. Instead of stating what certificate should be required, which would be rather indefinite in view of the differences in different parts of the country, the subjects upon which the candidate should be able to stand an examination ought to be mentioned. There ought to be no such thing as requiring a certificate of any kind, but a test of knowledge instead. It does not matter where the candidate acquired that knowledge, whether in school or by private study.

THE CHAIRMAN: Do you offer that as an amendment?

MR. WALL: No, I am simply speaking against the motion.

MR. LOWE: To carry out Dr. Wall's idea would require considerable work and the preparation of a syllabus for the examination. It would be of great service to the Boards of Pharmacy should someone take this up and work out a syllabus of the minimum amount of preliminary education a young man should have before he can be taken into the drug business. It seems to me he ought to be well grounded in arithmetic, through fractions at least, and he ought to be able to parse a sentence successfully, or, at least, to write a fair English composition. He ought to know something about geography. The motion offered does not say that the candidate should have graduated from the grammar school, but that he should have the equivalent of a grammar school education; therefore, he can get that equivalent in any way.

MR. OLDBERG: It occurs to me that we have not started out quite right in our method of taking up the propositions submitted by the program. I cannot think that this Joint Conference is expected to recommend any specific details. If you will please read the first proposition on the program, you will find that it simply requires us to consider whether it is not the duty of the Board of Pharmacy to prescribe and publish the minimum educational requirements necessary to render the conduct of the retail drug business safe to the public. We are simply asked to express our sense as to whether the Boards should fix such requirements as are referred to, and not that we should recommend any particular standard. After full discussion, it seems to me we should simply vote yes or no on the question whether definite standards are required, and then leave it to the Boards to say what these standards should be if any. The Boards have the power.

THE CHAIRMAN: As I understand it, all that is sought is the sentiment of this Joint Conference. The laws usually state that candidates applying for examination shall be examined by the Board. It is the province of the Board to say whether the candidate is fit. Any action taken by this Conference must be simply a recommendation.

MR. ANDERSON: I believe that many Boards have the power to make such rules as they see fit, and that the Boards of some states have greater power than the Boards in other states. The standards adopted should be such as can be readily complied with, and our recommendation should be elastic enough. I would, therefore, propose the following as a substitute for the motion now before us:

Resolved, That it is the sense of this Joint Conference that the Boards of Pharmacy should require of candidates for license to practice pharmacy, and for the registration of persons as assistants and apprentices, a preliminary education as high as the powers of the Board and the educational conditions in the section over which such Board has jurisdiction will permit.

THE CHAIRMAN: Will Professor Searby withdraw his motion?

MR. SEARBY: No, I think my motion is more definite. The nearer we come to something definite, the better.

THE CHAIRMAN: Is there a second to the substitute offered by Dr. Anderson.

MR. WALL: I second it.

The question on the substitute was called for and the Chairman put it to vote, with the result that the substitute was adopted.

The second question on the program was then brought before the meeting. Discussion was invited by the Chairman.

MR. OLDBERG: Upon this question, too, it seems to me that this meeting can hardly proceed to recommend any definite details. Progress is made only slowly in such matters as these. I, therefore, move that this question be recommended to the attention of the Boards of Pharmacy to be solved by them in their own way. All that this conference really can do is to point out that some solution of the problem is certainly necessary, that some information should be published. The Boards alone can determine how much information shall be given and how definite it shall be.

The motion was seconded. It was discussed, put to a vote and carried. Question Three on the program was then taken up.

MR. CHAS. CASPARI, JR.: It would be very desirable to enumerate specifically the subjects to be covered in the examinations, such as Chemistry, general as well as analytical; Botany and Materia Medica; Pharmacy, theoretical as well as practical, etc. A general enumeration of the topics would be useful. Since the question is before us, we cannot well afford to do otherwise than specify at least those subjects which I have named. I merely mention this as a suggestion to bring out further discussion.

MR. SEARBY: The suggestions of Prof. Caspari are right in a general way, but I think that the introduction of botany in the examinations given by Boards of Pharmacy would, in the present condition of pharmaceutical education, be almost farcical. I would eliminate the word botany, because I do not believe in going before the world on false pretenses. The general custom is somewhat as follows: A written examination in Chemistry, Materia Medica and Pharmacy, and a written examination on the reading, writing and translating of prescriptions. A number of drugs are submitted for identification. That is about the extent and character of the whole examination. Now, gentlemen, it has been my experience that a fellow with a good memory, after cramming for about three months, can go through that examination, even if he has never been in a drug store; but that is not a fair examination.

I was in London one time when a candidate was being examined for the privilege of practicing as a chemist and druggist. He was taking the minor examination. An examiner handed him a white powder, a piece of charcoal and a blowpipe, and asked "What is that powder?" The candidate went to work and found that the powder consisted of a bismuth compound. He was then handed another white powder and found that it contained lead. Such questions as that cannot be answered out of a quiz-book. It is not difficult to defeat a candidate who is trying to get through the examination on mere cramming. In an oral examination, I think I could determine in two hours whether a man is fitted to be licensed as a pharmacist. But the methods of examination are, perhaps, not before us. We should, however, tell candidates clearly what to expect and we should not frighten them with too many technical terms.

MR. CASPARI: When I mentioned botany, I had in mind simply so much of structural botany as is necessary to the recognition of crude vegetable drugs. In botany as well as in chemistry, I have in mind an examination which shall be practical. Pharma-

cognoscy is certainly necessary to the intelligent recognition of drugs and it involves a certain knowledge of botany.

Mr. OLDBERG: I wish to call attention to the fact that this question on the program was fairly provided for by the action taken by the Joint Conference of last year, in which we voted for the appointment of a committee to prepare a syllabus of the scope of State Board examinations and courses of instruction in the pharmaceutical schools. That committee on syllabus was appointed and has been at work for a year. They have reported progress at the meetings of the American Pharmaceutical Association, the Association of Boards of Pharmacy and the Conference of Pharmaceutical Faculties, this week. The members of that committee will provide a definite plan for us to discuss probably next year. Two-thirds of the members of the committee are members of the Boards of Pharmacy. It seems to me that we should wait for the report of that committee, which is our own. I am glad, however, that the executive committees of the Association of Boards and the Conference of Faculties put this question in our program of this meeting, so as to call attention to it, and I think it is wholesome to give that committee such views as we may be prepared to express. I like very much the idea of Prof. Caspari that the syllabus should be very general. If further discussion cannot be had at this meeting, I move that this question be passed over.

This motion was seconded and carried.

Question Four was then taken up.

Mr. OLDBERG: I move that that also be laid on the table.

Mr. SEARBY: I think the question of how candidates might best prepare themselves can be answered without going into details, and I should like to have something done before we adjourn. Do not let us put this off for a whole year.}

THE CHAIRMAN: Does Dr. Oldberg desire to withdraw his motion?

The motion was withdrawn.

Mr. SEARBY: I should like very much to hear from our chairman and from other members of the Boards of Pharmacy upon this subject.

THE CHAIRMAN: I wish to call upon Mr. Lillie, who participated in the preparation of this program, and who has had time to think about it for a whole year, to give us his views.

Mr. LILLIE: Candidates can best prepare themselves for board examinations by study and practical experience, and also, if possible, by attendance at a college of pharmacy.

Mr. BOND: In other words, let him learn his business in a drug store before he is examined.

Mr. GIETNER: It stands to reason that it is impossible to educate a druggist by a course in a college of pharmacy alone. He ought to have a college of pharmacy education, but his preparation for his occupation should proceed in logical sequence. A common-school education comes first, and the college course afterwards, but concurrently with that you should sandwich in the every-day duties of the drug store business, which he can get only in a retail drug and prescription store. The Missouri Board of Pharmacy does not have the discretionary power vested in the Board of Pharmacy of Arkansas. The State law fixes certain details. It provides that every candidate must be nineteen years of age, and he must be examined. Colleges of pharmacy are recognized under the

State law if the candidate can show that he has had four years of actual practical work in a drug store, and the graduate can then get his license without an examination. If he has had only the drugstore experience he must be examined. Competent druggists can be made only through drug-store experience.

THE CHAIRMAN: Proprietors and employers of drug stores should interest themselves in their employees. Apprentices and clerks need to be taught how to study. The teachers I see before me would advise these young men to attend the schools. Since I have been a member of the Board of Pharmacy, I have interested myself personally in young men anxious to obtain an education whereby they could earn their living in pharmacy. Employers should take time to instruct the young men in their employ and show them how to study. I have devoted two hours a week to that duty. I am proud to say that young men whom I have been able to advise have gone ahead, have succeeded and have gone through college. Circumstances made it impossible for me to go through a college of pharmacy myself. I was left to my own resources. Possibly it was the best thing that could have happened to me, because I came in touch with a man who gave me personal instruction and put me in the line of study. Young men going before the Board of Pharmacy have told me that they cannot grasp the meaning of the Pharmacopoeia and other books, but they simply needed to be shown how to study in order to be benefited.

MR. LOWE: If I remember correctly, I saw some years ago a little syllabus prepared by the Maine Board of Pharmacy, indicating what the apprentice ought to study to prepare himself for examination, but some Boards of Pharmacy have taken a different course. They have kept their questions secret, and in some cases copyrighted the questions so as not to permit them to pass out of their hands. Twenty years ago I had an amusing experience with a colored man whom I had in my employ. He was a bright fellow. I said to him one day, "Luke, I think it would be a good thing for you to study pharmacy. You will have about \$800 coming to you from your mother's estate. Put it in the savings bank; take a course of study. In the course of two or three years you can go through a college of pharmacy. There are lots of colored people in plenty of places." He asked me, "What would you advise me to study?" and I answered, "Take some simple substance, for instance, ginger. Here is the dispensatory. Read about ginger, and I will explain to you what you don't understand after you have gotten what you can from the book." He went across the street to a friend who kept a jewelry store and said, "I am going to be a pharmacist; I am studying ginger." The next day he asked the same question and got the same answer. He never got beyond ginger.

THE CHAIRMAN: We should like to hear from Dr. Wall on this question?

MR. WALL: I believe the tendency of pharmaceutical education is to ask too much that has no bearing upon the practice of pharmacy. One of the errors, I think, is that we are putting too much stress upon botany. It is necessary to understand pharmacognosy but we have hardly any use for botany in the drug business. Time is wasted in trying to learn how to analyze plants. I believe that the examination of powdered drugs is not necessary to the retail druggist. A great deal of work might be omitted from the course for the degree of Graduate in Pharmacy which might very well be included in the course given for higher degrees. Distinction should be made between the graduating pharmacist who is to practice pharmacy, and the professional man, the Pharmaceutical Chemist. Our pharmaceutical colleges ask too much for the degree of Graduate in Pharmacy.

THE CHAIRMAN: A vast majority of apprentices and clerks in pharmacy do not go to

college and there will always be a majority of them who do not go to colleges of pharmacy. The most necessary thing to start these men right is a good preceptor. I learned the business with a man who devoted much time to those who were apprentices with him. There ought never to be a time when college courses in pharmacy are obligatory. I don't think it is right. There are so many people who cannot afford it that an opportunity to obtain the necessary knowledge in some other way must be provided. Many a man has received his education through correspondence. The tendency, it seems, is in certain states ultimately to demand a diploma. I think it is wrong. It bars out many who would make just as good druggists as any of us, if given the opportunity. It is well worth while to graduate from a college of pharmacy. It is the best way. But if the young man cannot afford it, he ought to be allowed to learn in some other way.

MR. ELIEL: To my mind the chief obstacle to the acquisition of knowledge in the store is the fact that apprentices and clerks work too many hours. I do not work my men from sixteen to eighteen hours a day. My hours begin at seven o'clock in the morning, and I do not expect them to work after nine o'clock in the evening. Sometimes they are off at seven. Even Saturday night I never expect a man to stay after nine o'clock. If there is any work to do after that I am the one that does it. Our hours on Sunday are short. The clerk has the entire afternoon to himself. The Sunday clerk does not go on duty until eight o'clock. I do not care what my competitors do as to Sunday hours. My neighbors may keep their stores open till midnight. I close mine when I get ready. When boys come to me and ask for employment I ascertain what their preliminary education is, and will not accept less than one year's high school work. Then, if the boy is in earnest and answers other questions satisfactorily, I have a fair and square understanding with him and his father and mother, and I make a contract with him to stay with me until he is ready to go before the Board of Pharmacy or to go to a college of pharmacy. Quite a number of boys who have worked for me have had time to study, and have been shown the books that they ought to begin with, and they received such help and explanations as were necessary to make their study profitable. When the business permits and we have lots of time winter evenings, I give two hours each evening, four evenings a week, to talks on practical pharmacy and on other subjects, and I believe I get more work out of my boys than other employers. We have had a good class of young men. I don't run any side lines in my store except stationery.

MR. HOPP: The gentleman has not told us how he can afford to give all this time in the evenings to the boys.

THE CHAIRMAN: It is not too much to give half an hour a day to the boys.

MR. WHELPLEY: A common way to prepare for getting through the State Board is to take examination after examination until, by hook or crook or luck, the candidate manages to pass. Not long ago a candidate who took the Board examination wrote at the bottom of his paper, "This is my seventh examination. Where does the Board meet next time?"

MR. LOWE: Sometimes applicants fail in their examination through lack of sufficient knowledge of English. A nice young lady came to Prof. La Wall and said to him: "You will be my salvation." He asked, "What do you mean?" "Well, my husband is a druggist; he is an Italian, he got his diploma in Italy. He graduated in a prominent school of pharmacy and is well posted, but he knows comparatively little English. He has been before the Board but does not know English enough to pass." Prof. La Wall said: "Well, I will come down and see him." He made an agreement that he was to teach him English and in return the Italian would teach La Wall Italian. The

Italian went before the Board and passed satisfactorily. He was profoundly grateful and put something in Prof. La Wall's hands. It was two \$100 bills which he had given him. La Wall said: "I cannot take it. You taught me the Italian language." The man insisted and finally the matter was compromised and the Professor agreed to accept \$100. That is the kind of gratitude we don't often see.

MR. ANDERSON: Does Prof. Lowe recommend that method in answer to the question before us?

THE CHAIRMAN: In our state, candidates are required to pass in all subjects. If they fail in one subject they must take the examination again and that is one reason why so many have to go back several times.

MR. OLDBERG: I move that it is the sense of this meeting that the boards of pharmacy should give candidates, who wish the information, advice how to prepare themselves.

The motion was seconded and unanimously adopted.

Question Five was then taken up. The first half of the question, "Are courses of education in schools of pharmacy necessary or valuable," was answered in the affirmative by a unanimous vote.

The second part of the question, reading "If so, what practical and efficient means may profitably be employed to encourage such education," was then taken up.

MR. WALL: When any graduate of a good school of pharmacy comes before the board, he should be allowed credit on the theoretical part of the examination. The diploma of the college should be accepted as sufficient evidence of the theoretical training, and he should be examined only on the practical work. If boards generally let it be known that the theoretical part of the examination will be omitted in the case of graduates from good schools, I believe many men would go through the school to avoid taking that part of the examination before the state board. The board can then give them the practical examination, showing the fruits of their practical experience in the drug business. I believe such a plan would send many young men to the various schools who do not now take college courses.

MR. CASPART: The idea is an excellent one. There is no doubt in my mind that students who have attended a full course at college should be given credit in some form, and the fact that they have graduated is a sufficient test. I notice that a good many candidates fail in the board examinations simply on theoretical questions. Such questions are often a great stumbling-block to the candidate who has not attended a college of pharmacy. The plan suggested by Dr. Wall is worthy of commendation.

MR. BOND: There is no doubt that Dr. Wall is right. I am a modest man, so I will tell you that I drafted the Arkansas Pharmacy Law in 1881 and put at the close of it that graduates of respectable colleges of pharmacy may be registered by our Board without examination. You see, we believe in colleges down there in Arkansas. You will find that out next year. We believe in colleges of pharmacy and recognize them, and are proud of it. We would be very glad if other states of the Union would follow our example.

MR. SEARBY: I am pleased with Dr. Wall's suggestion. I wish to suggest in addition that as far as possible colleges of pharmacy shall make their courses practical. There is

another side to this question. I suppose many colleges have the same trouble that we have in California. Young men come and take the junior course. They then go before the State Board for examination and pass and that is the last we see of them. We have that trouble every year. They come to the college just for the sake of getting through the State Board. When the Board examinations are not thoroughly practical, this is likely to happen, and if the college courses are not practical, graduates of the schools of pharmacy are likely to fall down on the practical examination before the Board. When I was a member of the State Board of California, I opposed the licensing of graduates of pharmacy schools without examination, but I think a practical examination of graduates of pharmacy is sufficient.

MR. BOND: Have you ever heard of a man passing the Board of Pharmacy that ought not to pass? I have.

MR. LOWE: I think that the examinations by the Boards of Pharmacy are too exhaustive. I have no criticism to make of the Pennsylvania examination. Professor Hallberg said he considered it almost ideal, but the number of questions is too great to be answered in one afternoon. One hundred and fifty to two hundred questions cannot be answered in one afternoon. The candidate is apt to go down, not because he doesn't know, but because he cannot think and write rapidly enough. It would be better if fewer questions were asked.

THE CHAIRMAN: The Boards are more and more introducing practical tests in their examinations and eliminating part of what you call written work.

MR. WALTON: In reply to Dr. Lowe I wish to say that the Pennsylvania Board has resolved that hereafter the questions will be reduced one-half. In answer to the question, "What is the most efficient means of encouraging a young man to take a course in the college of pharmacy?" I am sure the answer is plain. It has been applied in two States. It is to pass a law requiring that he shall produce evidence of graduation.

MR. CASPARI: I would like to take issue with the speaker on that. I have been connected with a school of pharmacy for a great many years, but I still think it makes no difference where a man obtained his training if he can show, when called upon, that he is competent and trustworthy.

MR. KRAEMER: I hope Dr. Wall will reduce his motion to writing. Everyone admits the value of a college training in pharmacy, but let us do something that leads apprentices in pharmacy to attend college if they can. To exempt a graduate from the theoretical examination is a step in the right direction.

THE CHAIRMAN: Is Prof. Wall ready with his motion? If not, we will take it up later.

MR. WALL: I will submit it when I have written it out.

Question Six was then taken up: "What can be done to improve the efficiency of schools of pharmacy?" Can it be improved?

MR. LOWE: I would like to say on behalf of the members of the Conference of Faculties that it would give us a great deal of pleasure to listen to what the members of the boards of pharmacy have to say on that question.

THE CHAIRMAN: I will call upon Mr. Godbold to start the ball rolling.

MR. GODBOLD: I am not a college man, except that I am a graduate of pharmacy,

so I do not think I am the proper man to say to the members of the Faculties what they ought to do. I am not competent.

THE CHAIRMAN: What does Mr. Lillie have to say?

MR. LILLIE: I do not feel called upon to advise the teachers of colleges of pharmacy what they should do. Judging by the prospectuses of many colleges a student who has completed the course should certainly be equipped to answer almost any ordinary Board question, but we find that a good many students appear before the Board of Pharmacy and fail. Often applicants for registration disclose a good deal of illiteracy, show deficiency in ordinary composition. I don't know whether it is the fault of the college or the college professors, but there is evidently something wrong. A good many candidates are deficient in commercial training. That could be added to the college curriculum to great advantage. A student who goes from a college and presents his credentials to the Board, and is examined and receives his license, is supposed to know enough to go into a store and take charge of it, but many of them know very little about it. They are not competent to take charge of the business because their commercial education is not what it should be.

THE CHAIRMAN: I would like to call on Mr. White, of New Jersey. We have found him a very practical man as a Board member.

MR. WHITE: First, I wish to say that I am a great enthusiast in favor of college courses, but some colleges, according to my experience, have not paid sufficient attention to the proper preliminary education of the students they admit. We have found that graduates who have failed before the Board had an extremely poor preliminary education, so that they were not able to grasp the subjects of the college curriculum. The college courses are well planned. It is the fault of the student in many cases that he goes through without becoming qualified. I do not think there are many Board examiners who are not disposed to be fair in their examinations, but candidates have such poor mental training as to be unable to formulate their answers properly. Something has been said about the poor boy going before the Board. Personally, I have seen few cases of poor boys who could not make a success by determination and application. Lots of them fail for want of determination. One poor boy who came to my store and remained with me three years, then went to a college of pharmacy and passed there; then passed the State Board examinations of New York and New Jersey, went into the navy, then studied medicine, and is now a successful practitioner. Grit did it. Preceptors and examiners should be more careful to see that the examinations are thoroughly conducted, and that the theoretical education is such as it should be. That is about all I can suggest. If the courses in the colleges are too extensive, portions of the heavy requirements and branches less immediately applicable in actual practice might be reduced, but the practical instruction should not be left out.

MR. WALTON: According to my experience, when a college graduate fails, it is not the fault of the college, but of the man himself.

MR. OLDBERG: I would like to move that this question be laid upon the table and that we now take up the motion which Dr. Wall was requested to formulate.

The motion prevailed.

Mr. Wall then presented the following:

It is the sense of this meeting that Boards of Pharmacy can do much to encourage attendance at Colleges of Pharmacy by giving applicants for registration credit for theo-

retical work without examination if they are graduates of reputable Colleges of Pharmacy; the State Boards, however, should give the practical examinations themselves.

The motion was put upon its passage and unanimously carried.

The entire Question Five was then resubmitted as amended and was unanimously adopted.

THE CHAIRMAN: Is there any further business?

MR. OLDBERG: I would like to make a suggestion, to this effect: The American Pharmaceutical Association has a Section on Education and Legislation which holds two sessions annually. I think, Sir, that this Joint Conference should request the American Pharmaceutical Association to provide, if practicable, for three sessions of that Section annually, so that the Boards of Pharmacy and the Schools of Pharmacy may meet on the floor of the Association when that Section is in session. The floor of the American Pharmaceutical Association, of which we are all members, colleges and boards alike, is the best place for us to meet and discuss these questions with each other and with the many other pharmacists who are members of that Association. I have been extremely pleased to see how active the members of the Boards of Pharmacy are, and how well the meetings this year have been attended, but in my experience it is a very difficult thing to provide for a Joint Conference of the Boards and Schools on account of the serious difficulties in arranging the program for all the Sections of the American Pharmaceutical Association and the general sessions of that body. Education and Legislation are topics of the utmost importance to all pharmacists, to the American Pharmaceutical Association, to the National Association of Boards of Pharmacy and to the pharmaceutical schools, and there is no place where we can give better attention to these important matters than in that Section of the Association expressly organized for that purpose. I therefore move you that this Conference request the American Pharmaceutical Association to let us meet with that Section and that we abandon the separate effort to hold Joint Conferences of the Boards and Schools.

The motion was seconded and was unanimously adopted.

MR. WHELPLEY: Was any provision made for the publication of the minutes of this Joint Conference?

MR. OLDBERG: The executive committees of the Association of Boards and the Conference of Faculties can enlighten us.

THE CHAIRMAN: Has any provision been made for paying the stenographer?

MR. PUCKNER: The executive committees felt that the two Associations should share in the expense.

MR. SEARBY: I move that the matter of the publication of these minutes be left with the executive committees of the Association of Boards and Conference of Faculties.

MR. WHELPLEY: I offer as a substitute for that motion that a committee of three, consisting of Prof. Oldberg, Mr. Godbold and Mr. Lillie, be appointed to prepare questions for discussion to be included in the program of the Section on Education and Legislation at the next annual meeting of the American Pharmaceutical Association, and to arrange for the publication of the proceedings of this Joint Conference.

MR. OLDBERG: At the second session of the Section on Education and Legislation of

this annual meeting, the Boards of Pharmacy were recognized in a most effective and pronounced way. Two of the five members of the Committee on Education and Legislation are the President of the Association of Boards of Pharmacy and the Secretary of that Association. I, therefore, move that we request the Section on Education and Legislation to give us a place on their program as already suggested.

The appointment of the special committee moved by Mr. Whelpley was unanimously ordered.

MR. HYNSON: I move that this body request the American Pharmaceutical Association to publish the proceedings of this Joint Conference in connection with the minutes of the meeting of the Section on Education and Legislation.

This motion was carried.

A motion to adjourn was then adopted.

MINUTES

OF THE

SECTION ON SCIENTIFIC PAPERS.

FIRST SESSION—THURSDAY MORNING, SEPTEMBER 5, 1907.

In the absence of Chairman Reid Hunt, Mr. Chas. E. Vanderkleed, Associate on the Committee on Scientific Papers, called the Section to order at 10:20 a. m. in the "College Room" of the Hotel Astor, and presided as Acting Chairman. Secretary Virgil Coblenz was also present.

Mr. Vanderkleed stated that Dr. Hunt was unexpectedly called away to attend an international congress in Europe the latter part of July, and that the Secretary of the Section was also abroad at the time, so the work of the Section, its correspondence, etc., was referred to and looked after by him as best he could. He said he had taken up the matter of the Chairman's address with Dr. Hunt, but he wrote that owing to having to prepare several papers for the international congress, he was obliged to give up the work of preparing an address for the Section; that he had already started on it, but did not have time to complete it. Mr. Vanderkleed stated that under the circumstances there would be no Chairman's address this year. He stated, however, that there were a large number of papers before the Section, some thirty in all, and for that reason the Committee had felt compelled to put a limit in the program upon the amount of time set apart for each paper, and it would be necessary in most cases to present an extemporaneous abstract giving the important points. This would give a portion of the time to devote to discussion, which he thought was a very important thing.

The Chair then called for the report of the Committee on Ebert Prize as the first order of business, and Mr. Chas. E. Caspari of the Committee presented the report as follows:

REPORT OF COMMITTEE ON EBERT PRIZE.

The terms of award of the Ebert Prize are so explicit that many good papers presented to the Scientific Section were excluded from consideration by the Committee. Of those papers which were eligible, the Committee recommends that the Ebert Prize be awarded to Frederick B. Power and Frank Tutin for their paper on "A Chemical Examination of Eriodictyon."

HENRY KRAEMER,
CHAS. E. CASPARI,
A. B. STEVENS.

The Chair called for action upon the report just read, and on motion of Mr. Feil the report was ordered accepted and referred for publication.

The Chair called for a report from the Committee on Drug Market, but Mr. Gane, Chairman, was not in the room, and the report was passed for the time being.

The Chair then stated that the nomination of officers for the ensuing year was in order. Thereupon Mr. Puckner, following what he said was sort of a civil-service rule in this connection, nominated the present Secretary, Mr. Virgil Coblentz, of New York, for Chairman for the ensuing year. Mr. Coblentz suggested that he had once filled the position of Chairman of the Scientific Section some fifteen or twenty years ago, and he thought there might be some unwritten law against the same person occupying the position twice. No action was taken on this suggestion, however, and the nomination stood. Mr. Hays nominated Mr. J. M. Francis, of Detroit, for Chairman, but Mr. Francis begged off on the plea of being a very busy man. Mr. Francis, in turn, nominated Mr. Jos. Feil, of Cleveland, for Secretary, as Mr. Vanderkleed, the Associate on the Committee, protested that he could not fill the office on account of a press of other business. The Chair stated that other nominations would be called for at the next session.

Mr. E. H. Gane, Chairman, being now present in the room, the report of the Committee on Drug Market was again called for, and Mr. Gane presented the report as follows :

REPORT OF COMMITTEE ON DRUG MARKET, SEPTEMBER 1, 1907.

The year has seen some marked improvements. Fewer cases of variation from standard have appeared in the drug journals and in many cases these have been properly reported as deficiencies and not as adulterations. The wickedness of publishing a variation from an improper standard as an adulteration, thereby injuring the reputation of an honest pharmacist, subjecting him to the cost of fine and damaging his business reputation, was mentioned in our last year's report. How it operates is hinted at in the following communication from W. W. Bartlett to "The Apothecary."

There is a widespread feeling that the adulteration law of Massachusetts, as at present enforced, is a great hardship upon many worthy citizens of the Commonwealth. The question naturally arising is, "Are those statutes which give such extraordinary powers to Boards of Health constitutional?" The answer is that they are. The next question is, "Is there no limit to this power?" The answer is that there is a limit, but it occurs in such a limited number of cases as to afford but little relief.

This brings us to the real and vital point of the matter. Let us look for a moment at the Report of the State Board of Health as embodied in last year's Senate Bill Number 3, Food and Drug Inspection. Let us take the case of Frank A. Epstein of Boston and John M. Burke of Fall River, on page 14. In the first case the "adulterant" (so-called) was 4.2 parts of solids per 100,000 in distilled water and in the second case 4 parts per 100,000. Now the present U. S. Pharmacopœia allows 7.5 parts in 100,000. Quite true in accordance with the Pharmacopœia under which those prosecutions were made on October 28, 1905, and March 8, 1905, the distilled water was slightly below standard, but is it right that these gentlemen should be branded as adulterators? Were these

prosecutions and fines of \$100 each, "for the preservation of health" or simply done on the technicality of a very harsh and unreasonable law?

Again, on the same page in the case of Joshua L. Shikes of Boston, a case of so-called adulteration; extract of licorice, "adulterant wheat starch." The inference to all is plain that from this statement this man put "wheat starch," which surely is not extract of licorice, into his extract of licorice and so is held up to the world as a dealer in impure drugs or an adulterator of drugs. Let us see about this; what the man sold was the ordinary extract of licorice rolls such as is ordinarily sold by druggists and not made by him at all but simply bought in the open market as black licorice.

Let us look on page 139 of the U. S. Pharmacopœia, under the head of Extract of Licorice. We find that the standard is "that not less than sixty per cent. of it shall be soluble in cold water." Now the other forty per cent. may be "wheat starch," or as far as the U. S. Pharmacopœia is concerned, anything else, and yet the "wheat starch" found in this case is recorded in this report as an "adulterant." Other cases in this report may be cited, but these will well illustrate the point. It is not proposed at this time to criticise the taste of the Board of Health in prosecuting these men on such mere technicalities that in no way affect the "public health," but it is proposed to criticise the law that allows such things to happen. The point is that a man should not be held up to the public as an adulterator of drugs simply because his drugs fall slightly below an arbitrary and very technical standard, the public health not being at all injured thereby or even involved.

Again, the report of another prominent local Board announces that seventy-two per cent. of certain articles examined were defective. It has been intimated that the statement was largely based upon the results of examination of alkaloidal drugs and products. Divergent results would usually be obtained by the pharmacopœial processes.

Further, the fact that practically every large manufacturing house in the country whose goods were on sale in New York, was included as not exercising proper supervision over their products, presents a peculiar condition of affairs in view of the fact that these houses employ trained men of long experience in the one line of pharmaceutical assay, and are prompted by every consideration to have the work accurately done. The condition of alkaloidal assay work by the U. S. P. methods is manifest by referring to the report of the Chairman of this section of U. S. P. revision. He gives the range of results by seven *reputable chemists* using the same process for the same sample of drug, as follows:

	<i>Lowest.</i>	<i>Highest.</i>	<i>Difference.</i>	<i>Per cent. above lowest result.</i>
Opium.....	14.44	16.02	1.58	10.9
Aconite	0.81	1.21	0.40	49.4
Jalap.....	8.82	9.11	0.29	3.3
Colchicum.....	0.55	0.84	0.29	52.7
Ext. Belladonna Leaf.....	1.03	1.50	0.47	45.8
Belladonna Root.....	0.49	0.72	0.23	4.69
Belladonna Leaf	0.17	0.41	0.24	141
Hydrastis.....	3.23	4.00	0.77	23.8
Ipecac.....	2.52	2.91	0.39	15.5
Fl. Ext. Coca.....	0.32	0.45	0.13	40.7
Fl. Ext. Hydrastis.....	2.53	3.00	0.47	18.6
Fl. Ext. Cinchona.....	3.51	4.28	0.77	21.9
Fl. Ext. Ipecac.....	1.53	1.80	0.27	17.6
Fl. Ext. Belladonna Root.....	0.37	0.51	0.14	37.8
Stramonium Leaf.....	0.24	0.40	0.16	66.7
Ext. Nux. Vom.....	6.40	9.90	3.50	54.7
Tr. Nux. Vom.....	0.13	0.17	0.04	30.8

In view of these facts he concludes that Boards of Health should allow considerable latitude. They should pass opium if it assays 11.5 or 13 per cent. a range of 13 per cent. Tr. Aconite 0.038 or 0.052 a range of 37 per cent. instead of 2 per cent.

He also recognized the fact that drugs grown in different seasons vary in alkaloidal power to a marked degree, and cites the range in pilocarpus of from 0.3 to 0.75 per cent. Can we hope that the many Board chemists will all take this position?

Knowing this, why should not the Pharmacopœia have adopted a minimum *range* for alkaloidal drugs and preparations? If seven experts experienced in alkaloidal assaying employed by the Revision Committee, could not get more concordant results in the use of the U. S. P. processes, why should an average of their work be adopted as the inflexible standard?

In order to get further light your Committee on the Drug Market asked for reports upon conium seed and fluidextract. The statement has been published by H. M. Gordin that the process is very complicated and will hardly give concordant results. A very prominent expert states: "I regret to say that at present I am unable to recommend any method which is satisfactory for the assaying of Conium Fluidextract." Another—"We have had considerable difficulty ourselves with the process. So much so that we are chary of condemning any samples by the use of this assay process."

"The greatest source of error is in that portion of it wherein the Ammonium Sulphate is removed from the extractive by means of absolute alcohol. It is necessary to have the residue containing the Ammonium Sulphate absolutely neutral, as in the presence of the slightest trace of acid some of the Ammonium Sulphate passes into solution, thereby vitiating the final result. Up to the present time we have not been able to devise a satisfactory modification."

A member of the Revision Committee writes—"I do not have occasion to assay Conium preparations very often, so I am not in a position to criticise the process very closely. I have had no trouble with it as I have used it. The process when carefully followed is more apt to give high than low results, owing to a slight contamination with oil. The *method gave fairly uniform* results when tried by the Committee and I have not noticed any very adverse criticisms on it since." Another member of the Committee states—"My experience with assays of Conium has not been very extensive, but I have found the general plan of the U. S. P. assay as good as any. In the test assays made by members of the Sub-Committee, results were quite as concordant as those of assays of Belladonna and other similar drugs. Personally I should favor the choice of petroleum ether rather than ether as the solvent for the free alkaloid. If the hydrochloric acid is used only in very slight excess, the Conine hydrochloride obtained seems reasonably pure. On the whole I favor a gravimetric determination of the alkaloid as hydrochloride or as oxalate to titration of the free alkaloid."

If the fluidextract examined is a good preparation, results of an assay are quite satisfactory. In case of a poor preparation, particularly a poor extract, one is generally in doubt about the exact "strength" of the preparation, although very certain that it is below standard. If the U. S. P. assay left me in doubt of my result, I should check it by extracting the alkaloid a second time with petroleum ether (and alkaline bicarbonate), filtering and titrating the alkaloid with standard ($\frac{N}{10}$) acid.

No doubt retail pharmacists may get into trouble by purchasing assayed drugs from inexperienced dealers. A prominent house that has taken a very advanced position in relation to assayed drugs and in the pharmaceutical press has decried the reduction of standards by the Revision Committee, offered powd. red cinchona, high test, 11 per cent. alkaloids. Different assays gave an average of 2.64 per cent. total alkaloids. Powd. rio ipecac offered as 2.4 per cent., by one assay 1.15 per cent., by another 1.14 per cent. Powd. rio ipecac offered as 2.4 per cent., assayed 1.28 per cent. When attention was called to this variation, the following statement was made: "We can only offer ipecac

in the *whole* state, assaying 2.4 per cent. It was an error offering *powdered* ipecac on a guaranteed test, which we do not do under any circumstances. We beg to call attention to one term used, namely, the word 'guarantee.' We do not guarantee anything we offer in the way of assayed crude drugs. A new assay by our chemist gives 1.109 per cent. An assay by an outside chemist gives 1.37 per cent. Our previous assay of the whole root from which the powder was made, was 1.855 per cent. (sold as 2.4 per cent.). We cannot understand it."

A sample of whole aconite root offered by the same house as 1.1 per cent., assayed 1.05 per cent. Reduced to percolation powder assayed 1.03 per cent. Made into fluid-extract two assays were each 1.22 per cent. Reduced to 0.4 per cent. and check assayed, gave 6.8 per cent. extractive.

A sample of drug from another source assayed 0.52 per cent. Reduced to percolation powder, 0.49 per cent., fluid extract, 0.46 per cent. Reduced to 0.4 per cent. had 26.8 per cent. extractive. Notice the wide range in alcoholic strength of these two fluid-extracts, due to difference in extractive.

Every pharmacist purchasing these goods in good faith, on their assay labels and guarantee, would make defective products from them and be obliged to demonstrate that it was due to the material used and not to his own defective manipulation.

This factor is sometimes present. We have known of tinct. of opium made from a 12.5 per cent. granulated opium to assay, but 1 Gm. in 100 Cc. due to incomplete extraction. Illustrations and details could be multiplied, but enough had been said to again emphasize the statement in our last year's report that all interested in this matter of pure drugs should approach the study of the subject with open minds, and give every consideration to possible error of manipulation, of process, of source of supply, before bringing dishonor upon any individual's reputation or disgrace upon a worthy vocation. In such cases it will do no harm to recall: "But he that filches from me my good name, robs me of that which not enriches him, and makes me poor indeed."

Where wilful sophistication and adulteration is demonstrated, the perpetrator is sailing under false pretense and the real office of the law to protect the public health cannot be invoked too strongly. The N. Y. State Board of Pharmacy, Eastern Branch, reports that drug store goods approach much closer to standards than in previous years. 2,954 samples showed 319 deficient or 10.8 per cent. The deficiency in drug stores was 8.14 per cent. In general dealers' goods 39.6 per cent. Improvement in drug stores 2.06 per cent. In general dealers 21.11 per cent. It states that in many instances where the pharmacist was fined there was no evidence of intent to violate the law, but the samples failed to meet the standard requirements as to strength to a greater or less degree, due to neglect to carefully supervise the manufacture.

Other Boards of Health report favorably. Dr. Harrington, secretary of the Massachusetts State Board, in an address before the New Bedford Druggists' Association said that the drug part of his work gave him the least trouble. In 1905 only 228 of all the specimens brought in by the inspectors were found to be adulterated and only 12 per cent. of this 228 were of such a flagrant nature as to require them to be brought to the attention of the courts. In 1906 the percentage was somewhat higher because a number of samples of adulterated liquors were brought in from pharmacists in small towns whose principal business was liquor selling.

The question of labeling certain articles which do not conform strictly to the U. S. P. requirements, but which are notwithstanding pure products, should be considered carefully by the Association. This applies especially to certain essential oils. To mark such articles "for technical use" or similar designation is to cast suspicion on them, as this mark is already being used by dealers to escape liability for some variation beyond their control. It is not always practicable moreover to indicate on the label the exact standard under which the article is sold, where the article is subject to much variation.

In the preliminary notices of the U. S. P. it is expressly stated that "the standards of purity and strength prescribed in the text of this Pharmacopœia are intended to apply to substances which are used *solely* for medicinal purposes and when professedly bought, sold or dispensed as such."

If the Pharmacopœia decides that a medicinal salt shall not give a test for presence of iron and the dealer cannot purchase a product that does not contain a trace of iron, although it is medicinally pure in every other particular, this trace of a harmless element leads to its being marked "for technical use."

Alcohol in fluidextracts.—The fact should be emphasized that the alcohol strength of fluidextracts (and tinctures in a lesser degree) is subject to considerable variation from the wide range of moisture in drugs and the great difference in the percentage of extractive they contain. The strength stated upon the label is the average or approximate quantity. It would be advisable to secure some uniformity in the menstrua used for different fluidextracts not mentioned in the U. S. P. or N. F.

Examination of manufacturers' labels shows a wide range in these respects, due primarily to the difference in the menstrua used and in part to the method used in determining the alcoholic contents. The publication of tables of strength of menstrua only is misleading and of little service. Consideration of ten official fluid extracts will demonstrate the difficulty of any uniform standard when so many elements enter into the result. Omitting the variation caused by different proportions of water in the drug and the factor of loss by evaporation, and considering the presence of extractive alone, we have the following data:

Fluidextract of aconite, U. S. P. 1900. Menstruum alcohol, 3 volumes water; 1 volume 3000 Cc. alcohol, sp. gr. 0.816 at 15.6° C., weighs 2,448 Gm.; 1000 Cc. of water, 1000 Gm. Both, 3,448 Gm.

2,448 Gm. alcohol, U. S. P., 92.3 per cent. weight strength, contains 2,249.5 Gm. absolute alcohol. This amount in 3,448 Gm. of mixture is equivalent to 65.5 per cent. weight or 72.9 per cent. volume.

Range of extractive in fluidextract aconite assaying 0.4 per cent. alkaloid by U. S. P. 1900 method, from 6.8 to 28 Gm. in 100 Cc. Average, 22 Gm. Sp. gr. ranges from 0.9064 to 1.000. Average sp. gr., 0.985.

100 Cc. of average fluidextract weighs 98.5 Gm. It contains 22 Gm. dry extract and 76.5 Gm. menstruum, and if of 65.5 Gm. weight-strength contains 50.1 Gm. alcohol. This in 98.5 Gm. of fluidextract would give 50.86 per cent. weight-strength, equivalent to a specific gravity by table of about 0.9164, corresponding to 58.6 per cent. volume-strength.

If 16 per cent. of extractive was present the volume-strength would be —62.4 per cent. volume. A lot of whole aconite assayed 1.05 per cent.; ground to percolation powder it assayed 1.03 per cent.; made into fluidextract it assayed 1.22 per cent.; diluted by calculation to 0.4 per cent. with 72.9 per cent. volume alcohol, and again assayed, was 0.4 per cent. alkaloid. Sp. gr., 0.9064; extract, 6.8 Gm. in 100 Cc. Alcohol figured 60.5 per cent. weight or about 68.17 per cent. volume. Distilled it gave 66.4 per cent. volume.

Fluidextract apocynum, U. S. P. 1900. Menstruum glycerin, 1; water, 3; alcohol, 6. 1000 Cc. glycerin = 1246 Gm.; 3000 Cc. water, 3000 Gm.; 6000 Cc. alcohol, 4896 Gm., a total of 9142 Gm., containing 4896 Gm. of official alcohol or 4519 Gm. absolute alcohol, making strength 49.4 per cent. weight or 57.2 per cent. volume. Extractive with glycerin, 19 to 29 per cent. Average, 24 per cent. This does not represent all the glycerin, as varying amounts are lost in the evaporation, and to be absolutely correct the amount so lost should be known. Average extractive without glycerin, —18 Gm. Sp. gr., 1.012. 100 Cc. = 101.2 Gm., less 18 Gm. = 83.2 Gm.; liquid containing 40.9 Gm.; absolute alcohol = 40.6 per cent. weight-strength or 48 per cent. volume-strength

of fluidextract. If all the glycerin is considered, as in the extractive, the mixture of alcohol, 6 volumes, and water, 3 volumes, represents 57.2 per cent. weight- and 65 per cent. volume-strength. The average extractive with glycerin is 24 Gm. 101.2 Gm. — 24 Gm. = 77.2 Gm.; liquid = 44.15 Gm., or 43.6 per cent. weight- and 51.2 per cent. volume-strength of fluidextract. By distillation it yields 46.3 per cent.

Fluidextract aromatic, U. S. P. 1900. Menstruum, 92.3 per cent. weight or 94.9 per cent. volume. Average extractive, 9 Gm. Sp. gr., 0.8625.

100 Cc. fluidextract = 86.25 Gm., less 9 Gm. extractive, leaves 77.25 Gm.; liquid = 71.3 Gm. absolute alcohol in 86.25 Gm.; liquid = 86.66 per cent. weight, 87.6 per cent. volume. Distillation of lot sometime in stock gave 79.6 per cent. volume.

Fluidextract bitter orange. Menstruum alcohol, 2 volumes; water, 1 volume; 57.2 per cent. weight, 65 per cent. volume. Extractive, 22 to 27 Gm. Average, 24.5 Gm.; sp. gr., 0.980 to 1.000. Average, 0.990.

100 Cc. fluidextract weighs 99 Gm. less 24.5 Gm., leaves 74.5 Gm. liquid containing 42.61 Gm. absolute alcohol equivalent to 43 per cent. weight or 50.6 per cent. volume in the fluidextract. Distilled, gave 58.4 per cent. volume.

Fluidextract berberis. Menstruum 41.5 per cent. weight or 48.9 per cent. volume. Extractive, 6 to 8 Gm.; sp. gr., 0.960. 100 Cc. weighs 96 Gm. less 7 Gm. extract, leaves 89 Gm. liquid containing 36.93 Gm. Absolute alcohol equivalent to 38.56 per cent. weight or 45.7 per cent. volume in the fluidextract. Distilled, 49.5 per cent. volume.

Fluidextract buchu. Menstruum 65.5 per cent. weight, 72.9 per cent. volume. Extract average, 21 Gm.; average sp. gr., 0.935. 100 Cc. fluidextract weighs 93.5 Gm. less 21 Gm., extract leaves 72.5 Gm. liquid containing 47.48 Gm. absolute alcohol representing 50.8 per cent. weight or 58.6 per cent. volume in fluidextract. Distilled, 64 per cent. volume.

Fluidextract cannabis indica. Menstruum 92.3 per cent. weight or 94.9 per cent. volume. Extract, 10 to 12 Gm.; sp. gr. average, 0.857. 100 Cc. fluidextract weighs 85.7 Gm. less 11 Gm. extract, leaves 74.7 Gm. liquid containing 68.95 Gm. absolute alcohol equivalent to 80.5 per cent. weight or 85.9 per cent. volume in fluidextract. Distilled, 77 per cent. volume. (Ext. 13.1.)

Fluidextract cimicifuga. Menstruum 92.3 per cent. weight and 94.9 per cent. volume. Extract, 9 to 12 Gm.; average, 10.5 Gm.; sp. gr. average, 0.874. 100 Cc. of fluidextract weighs 87.4 Gm. less 10.5 Gm. extract, leaves 76.9 Gm. liquid containing 70.98 Gm. absolute alcohol representing 82.82 per cent. weight or 87.8 per cent. volume in fluidextract. Distilled, 72.4 per cent. volume.

Fluidextract cascara sagrada. Menstruum 32.50 per cent. weight or 39 per cent. volume. Average extract, 28.5 Gm.; average sp. gr., 1.076. 100 Cc. fluidextract weighs 107.6 Gm. less 28.5 Gm. extract, leaves 79.1 Gm. liquid containing 25.70 Gm. absolute alcohol representing 23.9 per cent. weight or 29.1 per cent. volume in the fluidextract. Distilled, 29 per cent. volume.

Fluidextract ergot. Menstruum 41.5 per cent. weight, 48.9 per cent. volume. Extract, 14 to 22 Gm.; average, 18 Gm.; average sp. gr., 1.020. 100 Cc. of fluidextract weighs 102 Gm. less 18 Gm. extract, leaves 84 Gm. liquid containing 54.86 Gm. absolute alcohol equivalent to 34.2 per cent. weight or 41 per cent. volume in fluidextract. Distilled, 40.52 per cent. volume.

In the following table Professor Stevens gives calculated volume strength of menstrua only which bears no definite relation to strength of product and is valuable only as a starting-point.

Professor Lyons takes into account extractive in determining alcohol in product and calls attention to the fact that moisture is a modifying factor.

Alcohol, 2 volumes, water one volume would figure 57.23 per cent. weight or 65.04 volume, but on account of condensation the real percentage volume is 62.97 per cent.

FLUID EXTRACT U. S. P. 1900.	A. B. Stevens menstrua vol. per cent.	A. B. Lyons menstrua vol. per cent.	A. B. Lyons max- imum per cent. of product.	A. B. Lyons aver- age volume per cent. product.	E. L. Patch men- strua vol. per cent.	E. L. Patch esti- mated average vol. per cent. of product.	E. L. Patch Vol. per cent. by dis- tillation of one product.
Aconite root	71.2	72.9	59.7	56.8	72.9	56.8	66.4
Apocynum	57.	58.7	50.4	46.9	57.4	48.	46.3
Aromatic	94.9	94.9	79.	73.1	94.9	97.6	79.6
Bitter orange	63.	65.	55.9	52.	65.	50.6	58.4
Berberis	48.9	48.9	45.5	42.6	48.9	45.7	49.5
Buchu	71.	72.9	62.7	56.	72.9	58.7	64.
Cannabis indica ...	94.9	94.9	86.3	78.7	94.9	86.	77. †
Cimicifuga	94.9	94.9	89.2	83.5	94.9	87.8	72. †
Cascara	38.	39.1	31.6	29.7	39.	29.1	29.
Ergot	48.9	48.9	41.3	38.4	48.9	41.	40.52

It is a tradition in some sections that no class of products is more deliberately sophisticated than the essential oils. Employees in these establishments have told remarkable stories of products being removed from original containers and skilfully prepared mixtures of one half value being substituted. They have in their possession formulas for making various blends adding resin, cheaper oils, allied oils, etc., a consideration of which is a disturbing factor to faith in these products. They assure you that mixtures can be made that will answer the U. S. P. requirements better than any obtainable natural product. It is stated by E. J. Parry that a careful inspection of the oil of rose industry convinced him that a specially distilled geraniol is used in practically all that is exported. Fifteen samples guaranteed as pure were all sophisticated. He gives the sp. gr. of pure oil as 0.850 to 0.853 and never above 0.855 while the market products range from 0.862 to 0.880 and contain much less phenyl-ethyl-alcohol than genuine oil. C. T. Bennett calls attention to the fact that artificial esters are prepared for the express purpose of sophisticating essential oils. Ethyl succinate for oil lavender, glyceryl acetate for oil peppermint, ethyl citrate an odorless product of high boiling point for use in oil. bergamot, oil lavender, etc.

This last may be converted into potassium citrate by saponifying with aqueous potassium solution.

It is understood that no oil of lemon is obtainable that will stand the U. S. P. requirements for citral, while answering all others. Good authorities state that some of the descriptions of these products are not based upon a natural, freshly prepared sample but upon commercial products.

When our drug laboratory at Washington is expanded to its logical destiny it should be able to secure by distillation, expression or otherwise in the presence of a reliable witness, absolutely pure specimens from different sources at different times and determine their composition while fresh and from time to time after exposure to the changes of oxidation and reaction. Then devise accurate methods for determination or purity.

When different lots of jalap vary in resin constituents from 2.10 per cent. to 22.14 per cent.; aconite root in alkaloid from 0.20 per cent. to 1.05 per cent.; jaborandi from 0.05

* This was a product with only 6.8 Gm. of extract making the product exceptionally high in alcohol.

† Reserves reduced in alcohol from moisture in drug.

to 0.9 and others show a wide range of variation, while extractive in different lots of the same drug will range from 8 per cent. to 26 per cent., it is reasonable to assume that there will be as great variation in the character of essential oils and natural oleoresins.

The table below gives results of the work and observations of the Committee for the year.

Since the preceding portion of the report, embracing all suggestions received by the chairman at a late date, was typewritten, sent to the committee for revision, and returned for final copying, a communication was received from Dr. Rusby and is appended as an addition.

I have carefully examined the report of which you sent me a copy, and approve of it as a whole, but there are several matters in it in regard to which I advise further consideration. I have indicated them by marginal numbers, as follows:

1. I should like to add to the general statement that the year has seen marked improvement, the specific statement that the examiners at New York have noted a remarkable improvement in the quality of goods there imported during the past year. The history of asafetida importations furnishes an illustration of the good that may be done by insisting upon a proper standard. When the present edition of the U. S. P. was being compiled, importers persistently urged upon the Revision Committee the claim that good asafetida could no longer be obtained, and they urged the adoption of a very low standard. Some even asked that there be no standard for the crude article, but only for an extract. This claim was resisted in the committee, in the belief that if a fair standard were firmly insisted upon, it would, within a reasonable time, be complied with, a belief that has been verified. The low grade asafetida so very common in this market a few years ago has almost wholly disappeared.

2. I do not think the inference quoted by Mr. Bartlett in regard to extract of licorice is justified, since it is well known that the law applies to selling as well as to producing, and especially since it is known that pharmacists do not usually make their licorice extract.

3. In relation to the report upon local conditions, the doctor calls attention to the fact that the board had to choose between making the matter personal, without fair warning, or to attack the *subject* and give a fair warning. Since the object was to correct and not to punish, the latter course seems to me to have been the right one. Such a thing could not have been managed without hurting somewhere. It was the culprits who gave themselves away by running about with their complaints. It was a wholly gratuitous assumption by the public that the percentage of defects found in the articles examined had any relation to the percentage in general existing. Of course boards are disposed to search for defects where they are most likely to exist, and any thoughtful person would recognize this fact.

4. In relation to the matter of comparative results by assay methods, he states: "If we are going into this subject, we should do it properly. If the opinions of the Chairman of the Sub-Committee on Assays of the Revision Committee are to be quoted, it should be clearly stated that he is responsible for the authorization of assay processes which absolutely insure and render unavoidable discordant results, when simple modifications of these processes would exclude such discordance. The discredit which has come upon the results of pharmaceutical assaying are largely due to these defects in the processes."

5. In relation to pilocarpus assays: "Indeed, I hope that we cannot expect any board to accept this monstrously incorrect statement. If a man assays worthless unofficial leaves as parallel with the official, he will get such results; otherwise not."

6. Referring to the communication from one of the Revision Committee on conium assay, he would say: "This is a poor comparison, for the belladonna assay is one so

constructed as to preclude almost the possibility of uniform results by different operators, though it may be just the opposite with a little modification."

7. "There never was and never will be any red bark yielding anything like this 11 per cent. as offered by the house in question."

The ipecac assay is another bungle, yet it is known that the standard has been lowered.

Acetone.

Acid in reaction. Not U. S. P. E. L. Patch.

Acid Benzoic.

5 lots. 1 contained notable amount of chlorine compound. E. L. Patch.

Acid Citric.

22 lots 99 to 100 per cent. pure. Trace of sulphate and iron in three lots. E. L. Patch.

Acid Hypophosphorous.

50 per cent. One maker's product invariably contains calcium oxalate. E. H. Gane.

6 lots. 48.04 per cent., 49.68 per cent., 50 per cent., 50 per cent., 50.3 per cent., 50.4 per cent.

Four contained calcium oxalate and one contained iron. E. L. Patch.

Acid Phosphoric.

11 lots. 87.5 per cent., 89.48 per cent., 85.7 per cent., 86.21 per cent., 85.6 per cent., 85.4 per cent., 85.97 per cent., 86.99 per cent., 86.19 per cent., 87.9 per cent., 87.76 per cent.

3 contained iron and sulphate. E. L. Patch.

Acid Tartaric.

35 lots. 99.4 per cent., to 99.8 per cent. pure. Four contained trace of copper; 9 traces of iron and excess of sulphate.

Aconite Root.

Uniformly below the U. S. P. standard. It should be 0.4 per cent. instead of 0.5 per cent. W. T. Hankey.

Five lots: 0.6 per cent., 0.53 per cent., 0.51 per cent., 0.57 per cent., 0.6 per cent.

E. H. Gane.

Whole: 1.05 per cent. Ground: 1.03 per cent. Whole: 0.46 per cent.

Powdered: 0.42 per cent. Whole: 0.57 per cent. Ground: 0.576 per cent. Whole: 0.49 per cent. E. L. Patch.

Aconitine.

Can be found answering all the U. S. P. tests except that with permanganate. E. L. Patch.

Alcohol.

Many liniments, hair tonics and toilet waters, etc., contain 42 to 95 per cent. wood alcohol. Theo. T. Wetterstroem.

Aloes.

U. S. P. requires nearly clear solution in warm alcohol. Find market lots 85 per cent. to 95 per cent. soluble. W. T. Hankey.

Alum.

Difficult to get clean. Always makes cloudy solution and shows presence of iron. W. L. Scoville.

Samples of powdered alum made opaque solutions with solvent in excess. Others dissolved clear. E. L. Patch.

Ammonium Bromide.

12 samples; 4 deficient. N. Y. State Board of Health, Eastern Branch.

Ammonium Carbonate, C. P.

94.24 per cent., 94.83 per cent., 94.22 per cent., 94.9 per cent., 96.72 per cent.

U. S. P. standard, 97 per cent. E. L. Patch.

Antimony, Black Sulphide.

Still found substituted by powdered anthracite coal. Other samples, marble dust, iron rust and graphite. Ind. State Chemist.

Arnica Tincture.

230 samples examined. 14 deficient. N. Y. State Board of Health, Eastern Branch.

Aristol.

Not one sample comes up to the U. S. P. iodine requirements. One did not contain any iodine. Dr. Drobegg.

Asafetida.

142 samples examined. Minimum amount soluble in alcohol 9.35 per cent. Maximum amount 65.15 per cent. 15 only were 50 per cent. Some of the impurities were mixture of gypsum and resins of asafetida. R. W. Moore.

Asafetida, powdered.

25 samples. Range of alcohol soluble extract from 8.85 to 23.66 per cent. Majority from 18 per cent. to 22 per cent. Ash, 20 per cent. to 60 per cent. W. T. Hankey.

47 samples. 11 as follows:

Alcohol-Soluble.			Ash.		
52	per cent.	61.8 per cent.	38.6	per cent.	7.4 per cent.
55.78	"	65.5 "	35.3	"	20.1 "
47.1	"	78.1 "	23.	"	7.3 "
59.4	"	74.4 "	29.35	"	21.4 "
50.	"	72.8 "	14.35	"	3.1 "
50.2	"		17.85	"	

36 other samples gave alcohol-soluble extract of 23 per cent. to 70 per cent., and ash, 11.7 per cent. to 59.8 per cent. E. H. Gane.

Asafetida, Powdered.

Soluble in alcohol, 25 per cent., 28 per cent., 33 per cent., 34 per cent., 37 per cent., 36.1 per cent., 38.6 per cent. E. L. Patch.

Arrowroot.

It is stated that no genuine Bermuda arrowroot has been offered for sale for some time; that none is being produced in Bermuda. A product is sold at 85 cents per pound that has been pronounced to be St. Vincent arrowroot manipulated to have the soft appearance natural to the genuine. E. L. Patch.

Balsam Peru.

Calcium hydroxide test is ambiguous and of questionable value. No two operators would guess alike as to the volume relations. It should be adjusted by weight if used at all. The action of calcium hydroxide depends upon the proportion of acid and neutral resins present. Exposure to water bath would depend upon the style of vessel and temperature. Usually adding calcium hydroxide, the mixture stiffens without heating and rapidly becomes harder. E. L. Patch.

5 samples ranged in cinnamein from 42.9 per cent. to 50.5 per cent. Acid No. 66.3 to 75.3. W. T. Hankey.

Artificial balsam is now extensively used in place of the natural article which is scarce. The artificial has a nice appearance, and tests 64 per cent. to 65 per cent. cinnamein. E. H. Gane.

Barium Hydroxide.

85.2 per cent. to 92 per cent. All contains traces of chlorides and nitrates. E. L. Patch.

Belladonna Leaf.

10 samples ranged from 0.230 to 0.516. Average, 0.334. W. T. Hankey.

16 lots, 0.36, 0.39, 0.42, 0.37, 0.20, 0.43, 0.32, 0.39, 0.369, 0.36, 0.317, 0.37, 0.387, 0.425. E. H. Gane.

7 samples, 0.38, 0.35, 0.276, 0.273, 0.28, 0.28, 0.35. E. L. Patch.

Belladonna Root.

Three lots, 0.68, 0.64, 0.52. E. H. Gane.

Three lots, 0.33, 0.51, 0.53. E. L. Patch.

Belladonna Liniment.

Twelve samples, 3 deficient. N. Y. State Board Health, Eastern Branch.

Benzoin.

U. S. P. requires almost entire solubility in 5 parts of warm alcohol. Market specimens of No. 1 quality yield 70 per cent. to 80 per cent. to warm alcohol.

Ash, 2 per cent. to 3 per cent. W. T. Hankey.

Average ash, 8 per cent. E. L. Patch.

Bismuth Subnitrate.

Nineteen lots assayed from 80 per cent. to 84.15 per cent. E. L. Patch.

Bloodroot.

5.16 per cent., 5.46 per cent., 5.60 per cent. E. L. Patch.

Borax.

Ninety-three samples, 74 deficient. N. Y. State Board Health, Eastern Branch.

Brandy.

All colored with caramel. This is true of the imported as well as domestic brands. W. L. Scoville.

Calabar Bean, Extract.

U. S. P. alkaloidal strength. It may be pasty, not in powder. Dependent upon the amount of fixed oil present. No provision is made for its removal. E. L. Patch.

Calcium Bromide.

97.8 per cent. Trace of bromate. E. L. Patch.

Spirit of Camphor.

Three hundred and twenty-five samples, 13 deficient. N. Y. State Board Health, Eastern Branch.

Thirteen samples. One 25 per cent. of required strength, one 35 per cent., one 70 per cent., one 50 per cent., one 45 per cent., one 67 per cent., one 43 per cent. Mass. State Board Health.

Cannabis Indica.

Ether-soluble resin 12 per cent., 10 per cent., 12 per cent., 10 per cent., 12.4 per cent., 10 per cent., 12.8 per cent. E. L. Patch.

Cantharides, Russian.

0.56, 0.40, 0.86, 0.65, 0.52, 0.66, 0.70, 0.62. E. L. Patch.

Capsicum.

Alcoholic extract, 26.4, 19.6, 20.7, 26.5, 24, 25.8, 16.2, 20.4, 21.6, 21.8. One sample contained notable amount of starch. E. L. Patch.

Chloroform Liniment.

Two hundred and forty-six samples, 42 deficient. N. Y. State Board Health, Eastern Branch.

Cinchona Barks.

9.56 total, 7.8 total, 3.46 total, 8.4 total, 6 total, 7.5 total, 10.4 total, 7 total, with ether soluble alkaloids 6.16; 5.82 total, ether soluble 4.90; 3.02 total, ether soluble 2.56; 5.08 total, ether soluble 5.06; 7.3 total, ether soluble 6.3; 5.5 total, ether soluble 4.36; 5.72 total, ether soluble 5.3. E. L. Patch.

Coca Leaf.

Three lots, 0.71, 0.70, 1.02. E. H. Gane.

Five lots, 0.61, 0.87, 1.59, 1.00, 1.03. E. L. Patch.

Cochineal.

Gray, 8.81; 9.41 ash. Silver, 25 to 35 per cent. ash. Black, 7 per cent. ash. One

sample of black of fine appearance was clearly weighted with black sand, 20 per cent. E. H. Gane.

Three samples, 5 per cent. ash, 4.4 per cent. ash, 4.5 per cent. ash. E. L. Patch.

Colchicum Seed.

0.5, 0.49, 0.40, 0.51. E. H. Gane.

Colchicum Root.

Six lots, 0.335, 0.46, 0.2, 0.47, 0.38, 0.36. E. H. Gane.

Collodion.

Varies considerably in strength, due probably to the variation in quality of pyroxylin used. Some has been $\frac{1}{4}$ to $\frac{1}{2}$ per cent. above the standard; some 1 per cent. or more below. W. L. Scoville.

Copaiba.

Most of that sold in New York and Philadelphia is heavily adulterated. Committee on Commercial Interests. N. A. R. D.

Since the first of the year the quality has steadily improved. Prior to that time it was difficult to obtain a straight article. Large quantity of spurious goods come from London and Hamburg. Even now admixture with African balsam is common, although on therapeutic grounds little exception could be taken to this admixture. It is now possible to easily obtain goods that will pass the U. S. P. test. The great advance in price bears eloquent testimony to the extent of the sophistication prior to the passage of the Food and Drugs Act. E. H. Gane.

Copaiba, Para.

27.3, 37.43 resin. Central American, 53.93, 54.45, 55.39, 56.33, 53, 52.7, 58, 50.5, 58, 55. Three samples did not meet U. S. P. requirements. Contained 40.38, 37.3, 40.7. E. L. Patch.

Cream Tartar.

28 samples from grocers. 13 consist almost entirely of substitutes, but were all sold at full price. Adulterants were acid calcium phosphate, calcium sulphate, etc. Samples from druggists were all pure. L. D. Havenhill.

Grocer's product. One contained 3 oza. cream tartar, $5\frac{1}{2}$ oza. tartaric acid, $3\frac{1}{2}$ oza. starch, 4 oza. calcium sulphate. W. L. Scoville.

Acetic Ether.

Sp. gr. at 25° Centigrade, 0.876. The standard 0.883 to 0.885. 25 Cc. with 25 Cc. of water just previously saturated with acetic ether separates 83.6 per cent. Standard, 90 per cent. E. L. Patch.

Gamboge.

One sample 41 per cent. insoluble in alcohol. Contained starch. Another, 35 per cent. insoluble in alcohol. Contained starch. E. L. Patch.

Gambir.

Ash, 7.02. Insoluble in alcohol, 70.47 per cent. Ash, 3.39 per cent. Insoluble, 31.20 per cent. Ash, 4.08 per cent. Insoluble, 22.06 per cent. E. H. Gane.

Guaiac Resin.

Insoluble matter from $2\frac{1}{4}$ to 29 per cent. Ash, 0.5 per cent. to 6.4 per cent. W. T. Hankey.

Insoluble in alcohol, 14.5 per cent. Ash, 3.93.

Insoluble in alcohol, 1.2 per cent. Ash, 0.14.

Insoluble in alcohol, 20.7 per cent. Ash, 5.19.

Insoluble in alcohol, 15.9 per cent. Ash, 4.35.

Insoluble in alcohol, 8.9 per cent. Ash, 1.94. E. H. Gane.

24 per cent. insoluble in alcohol; U. S. P. standard 15. 4.2 per cent. ash; U. S. P. standard 4. Acid No. 78. E. L. Patch.

Guarana.

Six lots, 4.15, 4.39, 4.44, 4.61, 4.64, 4.1 per cent. E. H. Gane.

Two lots, 4.1, 3.4 per cent. E. L. Patch.

Hyoscyamus.

Twelve lots assayed, 0.12, 0.04, 0.059, 0.067, 0.085, 0.099, 0.067, 0.086, 0.049, 0.092, 0.1, 0.07.

One sample of tops of *hyoscyamus muticus* assayed 1.1 per cent. of alkaloids. This should be worth cultivating instead of *hyoscyamus niger*. E. H. Gane.

Nine lots, 0.061, 0.0574, 0.0436, 0.0574, 0.092, 0.070, 0.071, 0.061, 0.073. E. L. Patch.

Hydrogen dioxide.

Runs pretty uniform in strength. Varies more in amount of free acid. Most of it is within U. S. P. limits. W. L. Scoville.

Goldenseal.

Fluid extract obtained in Germany is pronounced deficient in strength. Range of hydrastine 1.18 to 2.9. G. Heyle.

Five lots of roots, 2.9, 2.64, 2.8, 3.05, 1.66. E. H. Gane.

Tincture iodine.

513 samples examined. 36 deficient. New York State Board of Health, Eastern Branch.

Six samples deficient. 61 per cent. to 71 per cent. of required amount. Massachusetts State Board.

Iodine, Resublimed.

98.89, 99.11, 99.6, 100, 99.6, 99.8, 99. E. L. Patch.

Ipecac.

75 per cent. of all samples are below the 2 per cent. which was required by U. S. P. 1.75 per cent. is fair average. W. T. Hankey.

Ten lots of Rio, 1.82, 2.19, 2.08, 2.00, 1.9, 1.7, 2.27, 2.31, 2.2, 2.06. Ten lots of Carthage, 2.70, 2.47, 2.1, 2.21, 2.46, 2.15, 2.31, 2.33, 2.2, 2.25. One lot of Lahore, 2.09. E. H. Gane.

Nine lots, 1.46, 1.47, 2.0, 1.282, 2.03, 2.09, 2.09, 2.19, 2.03. E. L. Patch.

Iron Pyrophosphate.

One sample contained equivalent of only 6.3 per cent. of metallic iron. E. H. Gane.

Jaborandi.

Two samples of the black jaborandi assayed 0.108, 0.05. E. H. Gane.

Jalap.

Nine samples, resin 6.42 to 13.36 per cent.; ether-soluble 0.92 to 2.35 per cent. W. T. Hankey.

Ten lots, total, 9.9 per cent. ether-soluble 1.6.

" 8.83 " " " 1.38.

" 11.7 " " " 1.5.

" 8.96 " " " 1.51.

" 10.51 " " " 2.01.

" 9.77 " " " 1.37.

" 9.34 " " " 1.39.

" 11.05 " " " 1.45.

" 9.5 " " " 1.5.

" 10.01 " " " 1.55. E. H. Gane.

Two lots, " 11.43 " " " 1.18.

" 13.00 " " " 1.38. E. L. Patch.

Linseed Meal.

Starch is found in quantity in the parenchymatous layer lying between the mucilaginous epidermis and the sclerenchyma. The grains are round oval-shaped, quite

uniform. The largest 0.04 millimeters in diameter; consequently some starch is always found in the meal. Dr. P. Schuroff.

12 barrels ran from 24.45 per cent. to 29.68 per cent. oil. Has been rarely found to yield 30 per cent. oil. It always has a pungent odor, indicating the presence of other substances. W. L. Scoville.

12 lots in 1906 found to contain from 35.5 per cent. to 37 per cent. oil. 8 barrels in 1907 about the same range. E. L. Patch.

Licorice Extract, Powdered.

Attention should again be called to the fact that powdered stick licorice is usually supplied when this article is demanded. It contains of necessity some inert insoluble matter, usually starch, which is not to be considered an adulterant, as some official chemists are fond of declaring. E. H. Gane.

Varies much in proportion of extractive matter. Of 16 samples one contained 77.8 per cent. soluble matter; another 38.6 per cent., and the remainder between these figures. Starch is present in most samples. Glucose found in one. Soft extract of licorice mass not sold as pure extract. W. L. Scoville.

Lobelia Herb.

0.6, 0.4, 0.6, 0.58. E. L. Patch.

Lycopodium.

2 per cent., 1.4 per cent., 2 per cent., 3 per cent., 2.5 per cent., 1.4 per cent. ash. E. L. Patch.

Mace.

Adulterated with 25 per cent. wild mace. Massachusetts State Board.

Magnesium Carbonate and Oxide.

Most of the medicinal product will not respond even to the modified U. S. P. tests, although testing up to the standard so far as per cent. of oxide or carbonate is concerned. The difficulty seems to be in eliminating the last trace of soluble alkaline salts without largely increasing the cost of the official product. Some dealers are sending out these articles marked "for technical purposes only." E. H. Gane.

Magnesium Carbonate.

1 Gm. 0.452 residue, 91.19 per cent. of MgO. (U. S. P. standard 96 per cent.)

1 Gm. gave 0.443 residue, 91.54 per cent. MgO.

" 0.42 " 91 " "

" 0.423 " 93 " " W. L. Scoville.

Magnesium Oxide.

92.5 per cent. to 93.89 per cent. U. S. P. standard 96 per cent. W. L. Scoville.

Magnesium Sulphate.

Impossible to get it free from dirt; otherwise almost C. P. W. L. Scoville.

Magnesium Citrate Solution.

176 samples examined. 34 deficient. N. Y. State Board of Health, Eastern Branch.

Mercurial Ointment.

Samples tested 47.7 per cent. to 49.2 per cent. mercury, but the lowest test samples show presence of appreciable quantity of mercury oxide. W. L. Scoville.

Milk Sugar.

All examined contained appreciable quantities of free lactic acid and casein, but will pass U. S. P. tests. W. L. Scoville.

Myrrh Tincture.

44 samples examined. All up to standard. N. Y. State Board of Health, Eastern Branch.

Spirit Nitrous Ether.

151 samples examined. 1 deficient. N. Y. State Board of Health, Eastern Branch.

Nux Vomica Tincture.

3 samples examined. All up to standard. N. Y. State Board of Health, Eastern Branch.
4 lots of drug. 1.52 per cent., 1.35 per cent., 1.32 per cent., 1.2 per cent. strychnine.
E. H. Gane.

4 samples. 1.38 per cent., 1.27 per cent., 1.25 per cent., 1.208 per cent. E. L. Patch.

Oil Cajuput.

Green oil contains copper. Only one sample found copper-free. W. T. Hankey.

One sample original bottle was adulterated with kerosene and turpentine. Sp. gr. 0.915, rotation plus 0.5, cineol 35 per cent., traces of copper. E. H. Gane.

Three lots contained copper. One lot of rectified free from copper. E. L. Patch.

Oil Cassia.

Regularly adulterated with resin. One volume of pure dissolves clear in three volumes of 70 per cent. alcohol. If 5 per cent. of resin is present it is opalescent. 1 part of pure oil is slowly soluble in three parts of petroleum ether. Sp. gr. 0.650.

Resin fatty oils and other essential oils separate out. Hirschsohn.

Most imported contains traces of lead and some resin compounds. E. H. Gane.

The common contains lead. Twice rectified is free from lead. 3 lots. Sp. gr. 1.0508, cinnamic aldehyde, 90 per cent. 1.52c, cinnamic aldehyde, 90 per cent. 1.496, cinnamic aldehyde, 90 per cent. E. L. Patch.

Oil Clove.

6 lots. Sp. gr. 1.0436, Eugenol 83 per cent.

" 1.0461, " 83.5 per cent.

" 1.0445, " 83.5 per cent.

" 1.0420, " 87 per cent.

" 1.0426, " 86 per cent.

1 lot had Sp. gr. 0.9199. It proved to be a very poor mixture of residues and was worthless. E. L. Patch.

Oil Coconut.

Melting point 26°C., Congeals at 14°. Rises to 23°. Completely saponifiable by alcoholic KOH. E. L. Patch.

Oil Origanum.

Does not meet U. S. P. requirements. Sp. gr. ranges from 0.8426 to 0.9089. Rotation plus 5.4 to 8.46. Answers solubility test. W. T. Hankey.

Oil Lemon.

Very difficult to obtain oil with 4 per cent. of citral by U. S. P. assay. Samples tested as low as 1.8 citral; a guaranteed product was only 2.2 per cent. W. L. Scoville.

The highest assay found 3.46 citral. Sp. gr. 0.8506. Rotation plus 60.4°. E. L. Patch.

Oil Mustard, Volatile.

93.48 per cent. of allyl-iso-thiocyanate. E. L. Patch.

Olive Oil.

8 samples deficient. One contained 80 per cent. sesame oil, one 40 per cent. sesame oil, one 40 per cent. cottonseed oil, one all cottonseed oil. Mass. Board of Health.

Oil of Orange.

Varies considerably in quality and flavor in fresh samples. W. L. Scoville.

Oil Peppermint.

Many commercial brands not redistilled have a coarse flavor. W. L. Scoville.

Range in solubility of Michigan oil, 1 in 2½ parts of 70 per cent. alcohol to 1 in 3½ parts.

40 samples, only 6 were below the required 25° to 35° optical rotation. All contained over 50 per cent. menthol. The lowest ester content, 4.8 per cent. with 57 per cent. total menthol. The highest ester content, 7.8 per cent. with 58.4 per cent. total menthol. Have not found a redistilled oil that did not show dimethyl sulphide

Quality of the oil is largely dependent upon the season, whether wet or dry. W. T. Hankey.

4 lots. Menthyl acetate, 8.15 per cent.; total menthol, 57.66 per cent., sp. gr. 0.900.
 " " 9.27 per cent.; " " 52.73 per cent.
 " " 7.61 per cent.; " " 54.9 per cent.

Rotation. —21.5°, sp. gr., 0.9045. E. L. Patch.

Oil Rose.

15 samples offered as pure oil, contained geraniol. The true has a sp. gr. of 0.850 to 0.853 at 30° C. Never above 0.855. The market ranges from 0.862 to 0.880. The true oil contains a large amount of phenyl-ethyl alcohol. E. J. Parry.

Oil Rosemary.

10 samples; bornyl acetate, 2.25 per cent. to 3.82 per cent.

Total borneol, 6.46 per cent. to 10.1 per cent.

One sample contained 5.6 per cent. ester to 11.5 per cent. borneol.

Another contained 6.1 per cent. ester, 14.2 per cent. borneol.

Sp. gr. 0.8907 to 0.985. W. T. Hankey.

6 samples—

Sp. gr.	Optical rotation.	Bornyl acetate.	Total Borneol	Solubility in 80 per cent. alcohol.
0.905	—4	4.2	15	Not sol. in 10 vol.
0.905	+12.25	1.7	10	Sol. in 2 vol.
0.904	+23.5	3.0	15	Sol. in 2 vol.
0.905	—4	4.9	10.9	Not soluble.
0.894	—1	3.2	14.4	Sol. in 20 vol.
0.906	+9	5.5	15.4	Sol. in 20 vol.

E. H. Gane.

0.901 2.89 9.67

0.900 2.29 8.88

0.9072 +9.3 6.33 9.66

0.903 +3 1.21 12.47

The first 10 Cc. of the distillate from this product had a rotation of —1.6, which is contrary to standard. E. L. Patch.

Oil of Thyme.

Six samples. Optical rotation, +1 to —12.6. Phenols, 13.5 to 26.5. Sp. gr., 0.8909 to 0.943. The red oil meets all the requirements of the Pharmacopœia with the exception of the color. U. S. P. calls for white oil. W. T. Hankey.

Sp. gr., 0.8687. Rotation, —17; phenols, 10 per cent.; not soluble in 10 volumes of 80 per cent. alcohol. Contains turpentine. E. H. Gane.

Oil Wintergreen.

Sold as leaf oil, is optically inactive. Has a birch-like odor. W. L. Scoville.

Oil Wintergreen Leaf.

Three lots, sp. gr. 1.179, optical rotation —0.5.

" 1.1763, " " —0.5.

" 1.179, " " —0.4. E. L. Patch.

Pilocarpine Hydrochloride.

The distinctive test with hydrogen dioxide and potassium dichromate has been pronounced unsatisfactory. E. L. Patch.

Plumbi Acetas.

Purified granular. Frequently contains excess of carbonate. E. L. Patch.

Pinkroot.

Sometimes substituted by root of E. Tenn. pinkroot, *Ruellia cilicea*. Sometimes acci-

dentally contaminated with hydrastis, serpentaria, wild yam and stoneroot. W. N. Stockberger.

Pocophyllin.

By alcohol and acetone processes. By alcohol, physical appearance light greenish-yellow. Solubility in alcohol 58.8 per cent., in ether 90.85, in chloroform 74.95, ash 0.75. Acetone process, physical appearance brownish yellow. Solubility in alcohol 98.8, in ether 92.15, in chloroform 75.2, ash 0.70. One hundred pounds of drug by the alcohol method gave 4.25 per cent, by the acetone method 4.75 per cent. Previous lots had yielded 5.5 per cent. It is yet to be proven if the acetone product is the same chemically and therapeutically as the U. S. P. alcohol product. Smith, Kline and French Co.

Potassium Bicarbonate.

99.51 per cent., 99.75 per cent., 99.76 per cent., 99.7 per cent. E. L. Patch.

Potassium Bromide.

Thirteen samples examined. Two deficient. New York State Board of Health, Eastern Branch.

Ten lots examined, U. S. P. E. L. Patch.

Potassium Carbonate.

Different samples contained much dirt, others trace of iron and chloride. Average to assay 98 per cent. E. L. Patch.

Potassium Citrate.

Twelve lots. Two contained excess of heavy metals, one was excessively acid. E. L. Patch.

Potassa.

Assayed, 84.04 per cent., 85.21 per cent, 85.3 per cent., 86.64 per cent., 85.55 per cent., 85.14 per cent. Two contained large excess of chlorides. E. L. Patch.

Potassium Iodide.

Fifteen lots, U. S. P. quality. E. L. Patch.

Potassium Permanganate.

Five lots assayed over 99 per cent. In titrating following the U. S. P. method a precipitate of hydrated oxide of manganese is formed. It is better to add an excess of $\frac{1}{10}$ oxalic acid, say 35 Cc., and then titrate back with $\frac{1}{10}$ permanganate.

Seidlitz Mixture.

200 barrels contained trace of chloride, trace of sulphate; several traces of iron; ten not thoroughly mixed. Samples from different portions of the barrels assayed differently; otherwise were U. S. P. Sample of Seidlitz Powders. Mixture contained 45.88 per cent. of sodium bicarbonate instead of 25. E. L. Patch.

Soap.

Much offered as pure Castile soap will not pass the non-gelatinizing test of the U. S. P. Samples probably contain some animal fat. W. L. Scoville.

Soft Soap.

Frequently contains an excess of caustic alkali. Always contains free carbonate alkali. W. L. Scoville.

By the U. S. P. test required 4.5 Cc. of $\frac{1}{10}$ oxalic acid equivalent to 0.5 per cent. of KOH. By the neutral alcohol method the same sample gave 0.336 free KOH, 0.926 K_2CO_3 . 8 samples by the U. S. P. 1900 process tested by U. S. P. method of assay gave from 0.25 to 0.5 per cent. free KOH. 4 lots of commercial by the neutral alcohol method gave 0.336 to 0.896 free KOH. E. L. Patch.

Soap Liniment.

91 samples examined, 3 deficient. N. Y. State Board of Health, Eastern Branch.

Soda, Caustic.

95.72 per cent., 96.31 per cent., 94.36 per cent., 94.98 per cent., 95.01 per cent. E. L. Patch.

Sodium Bisulphite.

21.91 per cent., 20.67 per cent., 87.64 per cent., 85 per cent., 93.33 per cent. Only one U. S. P. strength. E. L. Patch.

Sodium Bromide.

13 samples, 2 deficient. N. Y. State Board of Health.

Sodium Citrate.

10 lots, 4 contained heavy metals, one an excess of alkali. E. L. Patch.

Tartar Emetic.

All samples examined for fifteen years have had traces of arsenic. W. T. Hankey.

Thymol Iodide.

One lot contained 1.8 per cent. of alkaline iodide. E. L. Patch.

Vanilla Extract.

6 samples examined, 3 below standard. Mass. State Board.

White Wax.

Will not meet the U. S. P. requirements on melting-point. 25 samples ranged from 53° to 63.8° centigrade. All met requirements for gravity and saponification number, but none were classed as pure upon more complete examination. W. T. Hankey.

Witch Hazel Extract, Distilled.

80 samples, 4 deficient. N. Y. State Board of Health, Eastern Branch.

Many samples in Buffalo found deficient. Amer. Druggist.

Varies in alcohol from 13.5 per cent. to 15.1 per cent. W. L. Scoville.

Contains formaldehyde, and is deficient in alcohol as follows:

9.54 per cent. alcohol, formaldehyde.				8.14 per cent. alcohol, formaldehyde.			
10	"	"	"	9.57	"	"	"
9.04	"	"	"	12.38	"	"	"
7	"	"	"	9.43	"	"	"
10.92	"	"	"	7.93	"	"	"
6.64	"	"	"	9.29	"	"	"

—Mass. State Board.

EDGAR L. PATCH.

E. H. GANE.

W. L. SCOVILLE.

L. F. KEBLER.

Mr. Rusby discussed the report, and referred, first, to the adulteration of extract of licorice. He said that the Pharmacopœia required that the extract of licorice—not the official pure extract, but the commercial extract—should contain sixty per cent. of soluble matter, but if it was pure, and nothing was added to it, it was almost impossible for it to contain as much as five per cent. of insoluble matter, or ninety-five per cent. of soluble matter. He thought it would be much better for the Pharmacopœia to specify what foreign matter should be introduced into the pure extract instead of leaving that to the manufacturers, who sometimes used damaged flour and other objectionable substances for this purpose.

As to the report referred to, Mr. Rusby said he was responsible for the report of the New York Board of Health on adulteration. He took the samples which were deficient, specified the defects in each one with very great care, and then stated that it would be seen that of the samples examined seventy-two per cent. were defective. When you come to look

for adulterated specimens of a drug you pick out the drugs most liable to be defective, and although seventy-two per cent. in this case were found to be defective, it might not represent one-half of one per cent. of the drugs that are ordinarily bought. He criticised the misleading statements made by certain parties on this subject. He believed the manufacturers and the Boards of Health were trying to work in harmony in this matter, and he thought it was most unfortunate that there should be a disposition to misrepresent the facts.

As to the condition of the drug market at the present time, he said he had been selected by the Department of Agriculture to assist in inspecting the drugs coming into the port of New York, and he could say that conditions were greatly improved; for instance, during the whole month of August he had only had occasion to condemn six articles at that port, and he had been overjoyed to see that the goods generally were not only admissible, but were of very superior quality. This was especially gratifying, as he had been told by the appraisers and others when he entered upon this work that a very bad state of affairs existed.

Then Mr. Rusby took up the subject of asafetida, and reminded the members of the situation five years ago, when a good many importers of the City of New York appealed to the Committee on the Revision of the United States Pharmacopœia to reduce the requirements as to that product, stating that the demand of seventy per cent. pure was unreasonable, and that it was impossible to get more than about fifteen or twenty per cent.; that they had stated it was all right to have a high standard for the extract, but argued that they ought to be allowed to import anything they wanted in the way of the crude drug. He also reminded the members of the position the Revision Committee took for a high standard in this matter, refusing to accede to the demand of the importers, with the final result that during the past year only one lot of asafetida had been received at the port of New York below standard.

He said he desired to see for himself whether the present good condition in the importing line represented that which had previously existed, and he had gone out and bought quite a lot of drugs of certain kinds which were especially liable to be adulterated. He bought, first, from the importers of the City of New York. He found that thirty-three per cent. of those drugs had to be condemned, evidently stock which had not been sold out, and which had been held from previous years. If it were stock now imported, he did not believe it would have amounted to three per cent. Then he went to the retail pharmacists, who had stock which had been on hand two or three years, and fifty per cent. of that was below average. He thought there was a steady improvement going on, and that the pharmacists of the country ought to be congratulated on it.

Continuing, Mr. Rusby said that instances could be cited where persons had died of heart failure, after being given enormous doses of tincture of

strophanthus, because of the poor quality of the preparation used, due to the fact that it was made from spurious seed. Most of the strophanthus seed imported is spurious. He exhibited two specimens, one a dark brown seed, which was spurious and worthless, and the other a fawn-colored seed, with a greenish tinge, which was genuine. His next reference was to jaborandi leaves, of which he exhibited samples, and said it was an exceedingly difficult thing to detect the genuine from the spurious in the leaf form, and that he had himself been mistaken about it; but if the leaves are reduced to powdered form it is not so difficult, for one yields a yellow powder and the other a dark green.

Mr. Rusby also exhibited samples of quebracho bark, one of superior quality, all bark, and the other adulterated with wood. Also samples of male-fern, likewise frequently adulterated. He described how these things were adulterated in preparing for the market.

He showed a sample of chicory, undoubtedly imported for dandelion. He said the importers should remember that the law permitted the importation of Japanese aconite, provided it was so labeled; otherwise it would be misbranded under the law. He exhibited a sample from a lot that came in labeled "Aconite," but which had been found to be Japanese aconite. He said he had been recently called upon by an importer who was in trouble because he had brought in some Bombay mace, and the appraiser would not let it pass because it was labelled "Mace" instead of "Bombay mace," the latter being used for purposes of adulteration, and must be imported under its proper name. Under the interstate commerce law the importer could not sell it as "mace" in New Jersey, for instance, without its being properly labeled, but he could do so in the State of New York; likewise, it would be sold in Jersey as Bombay mace, and the druggist there could re-label it as "mace" without incurring any penalty under the interstate commerce law. This condition would be brought to the attention of the New York Legislature very soon. The only successful way, however, to deal with this question is for the federal, state and city governments to work together.

Mr. C. E. Caspari stated that the reference to extract of licorice reminded him of the fact that the United States government, in ordering supplies for the army, specified powdered extract of licorice, when, as a matter of fact, as is well known, the pure extract of licorice cannot be powdered except by the introduction of starch or some other inert substance, and the Department at Washington would reject that as being an adulteration. He asked Mr. Kebler, of the Drug Laboratory, if he could say just what was expected when the pure extract was ordered.

Mr. Kebler replied that the Department had nothing to do with these orders, that they came from another branch of the Government service, but he would make inquiry about this matter when he returned to Washington. He said they were always glad to get information of this character, because indirectly it reflected on his Department.

Speaking of powdered asafetida Mr. Kebler said that term was an actual misnomer, and he had always stood for its elimination from the catalogues and the correspondence of all dealers, because asafetida cannot be powdered except when diluted with a large quantity of inert matter. The information given by Mr. Rusby as to the adulteration of asafetida was in line with that coming from other sources.

Referring to Mr. Rusby's remarks as to the improvement in the character of drugs coming into the country through the port of New York, Mr. Kebler said that that was easily explained; it was now known that we have closed the port of New York and other ports of entrance against inferior drugs, and the inferior drugs are now coming in through other ports not yet closed against such products. Just as soon as possible, however, these channels will be closed also. His department would make every possible effort to keep inferior drugs out of the country, or at least compel them to be labeled exactly what they are.

Mr. Kebler went on to say that products containing wood alcohol had been imported into this country to a large extent from Canada and other sources. One firm in Canada had been importing so-called "Veterinary remedies" marked "Tincture Cinchona Compound, Meth.," which would mean nothing to the lay mind, and these goods had been used, not only for horses and cattle, but for ordinary consumption. The Department had stopped this abuse, however.

He said the remarks of Mr. Rusby on *strophanthus* applied with equal force to *digitalis*. One prominent manufacturer had urged the Department not to draw the lines too tight on *digitalis*, saying they could not get the product required by the Pharmacopœia. Their reply had been that it was better to keep it out of the country entirely than to admit an inferior product. The reliability of this drug in cases of heart disease is of the highest importance, and the physician wants to know what he is giving, and does not want an inferior quality.

Mr. Rusby suggested that there was not a single case of the importation of spurious *digitalis* through the port of New York in August.

Mr. Kebler went on to say that he could cite case after case where various smaller manufacturers were supplying goods not up to the pharmacopœial standard, especially for consumption in the state of manufacture. He cited a case of a manufacturer in Pennsylvania who had declared his purpose to use certain preparations containing wood alcohol in that state, though he said he would not attempt to use them outside of the state, on account of the interstate-commerce regulations. He cited other cases where inferior drugs were properly marked, so far as the federal law was concerned, but in the state where the goods were manufactured they did as they pleased.

Mr. Kebler also called attention to the fact that the sweepings and dirt of all kinds from crude drugs are being brought into this country as dilu-

ents of good products, and sold as such to the dealers. One importer had made this point: What difference does it make if used in the manufacture of fluidextracts? The difference is that these sweepings, which come in at some four or five or six cents a pound, sometimes come in absolutely powdered form, and are sent out to the wholesaler or retailer as pure goods, and used as such. This importer said if they could all be put on the same basis in this matter he would be very much pleased, but as long as the situation was as at present he was compelled to use these products in competition.

Mr. Kebler closed by making an earnest plea that every man should be placed on a uniform basis, so that business could be properly conducted on a safe and honest plane.

Mr. Rusby, referring again to the subject of digitalis, said that if there was anyone present from Oregon or the State of Washington, he would like to remind him that it was credibly reported, and was undoubtedly true, that digitalis grows along the roadsides there from eight to twelve feet in height, and if an attempt was made there would be no trouble in getting all the digitalis in these States that this country needed. He did not know whether it was of good quality or not, as it had not been thoroughly tested; but he thought it would probably be as good as anything imported.

Mr. Sayre mentioned a sample that had been brought from Albuquerque to his college for analysis, but he thought the analysis showed that the quality was not as good as the imported article. He was inclined to believe that the fact that it had been planted near a watermelon patch was an explanation of the trouble.

Mr. Searby, speaking of the subject of digitalis on the Pacific slope, stated that a few years ago a student in the California College of Pharmacy obtained some of the plant from some place in Oregon, and his analysis showed a very excellent percentage of digitalin; but as there is always difficulty in making an analysis of digitalis, and as he was a young man and comparatively inexperienced, they had not placed too much reliance upon his results. However, he knew personally that digitalis grew well in some parts of California; he had seen it growing wild in Central California, and he thought it would grow even better and larger in Oregon, where they had more rain. Belladonna had also been grown successfully in Golden Gate Park. Mr. Searby said he did not think the knowledge of native digitalis was yet sufficient to warrant any definite statement in regard to it.

Mr. Lloyd said he could see no reason why digitalis should not be raised in America, as it was one of the easiest of all crops to raise. He said if the plant, which grows like dock, was cut down with a scythe the first season, a great deal of digitalis could be obtained; but if one is compelled to wait for the next season to get the second year's growth, as directed by

the Pharmacopœia, there would be very little digitalis; and that is why we are getting so little from abroad at the present time. He thought abundant digitalis could be raised in this country to supply its needs.

Speaking of licorice, Mr. Lloyd said he had studied the subject last year in the Oriental home of licorice in the valley of the Meander and the valley of the Hermes, in Asia Minor. In these valleys, as history tells us, the great armies of the past—the hosts of Xerxes and Darius and Cyrus and Alexander the Great—trod and fought and died, and watered these plains with their blood. The valley of the Meander is rich from the soil that has been washed down from the mountain sides. This valley is one great licorice field. Wherever you find a wheat field, there you will find the licorice plant. Wherever you find the vineyard of the Turk, you will find licorice abundant in it. It is a weed that cannot be exterminated from these valleys. Mr. Lloyd said he had seen great piles of licorice root the size of rows of two-story houses and had seen the making of licorice extract which tobacco men do not bring into America on account of the duty, and which is sold and used in Europe. In the city of Sophia are made quantities of extract of licorice that is used throughout all Europe. There is nothing but licorice-root used in these Oriental factories. The extract is made in a most primitive manner, by two or three boilings in vats of water, then finally boiling it down until it contains only about twenty-two per cent. of moisture, when it will break when allowed to cool. This is the licorice supplied to the world from the Orient—the true extract, without any adulteration, and with no alteration, except from heat and the dust that settles into it from the outside. He had seen in one of these factories a vacuum apparatus for making the extract, but it was not in use, while the open kettles of the works were moving on as rapidly as possible.

Concerning the powdered extract of licorice, Mr. Lloyd said that since his return home he had received from one of the independent licorice manufacturers of Smyrna a sample of powdered extract of licorice without moisture, which they proposed to send into America if they could get it here—guaranteed to be absolutely pure, nothing but licorice. He could not comprehend how they could put anything very much cheaper into it than licorice in making this extract, as the Turks that gathered it get twenty-five or thirty cents a day for their work, board themselves, and furnish their own animals to bring the licorice in to the factories, and it is difficult to think of anything that they could raise in greater abundance or cheaper in the valley of the Hermes and the valley of the Meander than licorice.

Mr. Eccles said he was in the valley of the Meander following the visit of Mr. Lloyd, and could confirm all he said about the production of licorice there.

Mr. Houghton said he regretted that he came in too late to hear the

paper just read, but he had been much interested in the discussion as to the active properties contained in digitalis leaves grown in this country. During the past three years he and his associates had had an opportunity of testing the physiological activity of digitalis leaves grown in Oregon, Tennessee and Michigan. [The tests were made in fluidextracts prepared according to the U. S. P., from carefully cured leaves sent in for examination.

For estimating the physiological activity of these preparations, the minimum fatal dose per gram body-weight of frogs, when properly diluted and injected into the abdominal lymph sac, had been determined in accordance with the method which he published nearly ten years ago in the Journal of the American Medical Association. In every instance they had found the activity of the preparation superior to that of an average sample of first-class imported drug, and in some cases exceeding in activity the best samples of English leaf obtainable. It seemed to him, in view of the facts that had been offered, and in view of the results of his experiments, that we are entirely justified in the belief that we should be able to grow in the United States as satisfactory digitalis leaves for pharmaceutical purposes as can be grown in any part of the world. He had already commenced some experiments to determine the relative activity of first and second-year leaves, when grown under various conditions.

Mr. Cohn said that from this paper and the discussion it would seem that the first year's growth of digitalis was almost, if not quite, as active as the second year's growth. He called attention to a recent publication upon this subject of the relative value of the first and second year's growth of this plant.

The Chair called on Secretary Coblentz to read a short summary of the following paper on grindelia, by Mr. F. B. Power and his associate :

CHEMICAL EXAMINATION OF GRINDELIA. PART II.

BY FREDERICK B. POWER, PH. D., AND FRANK TUTIN.

[A Contribution from the Wellcome Chemical Research Laboratories, London.]

In a paper communicated to this Association at the meeting held in Atlantic City, N. J., in September, 1905 (Proc. A. Ph. A., 1905, 53, p. 193), the authors described the results of a general examination of the constituents of *Grindelia*. The material employed in that investigation consisted of an original bale of the drug obtained from California, and it was stated that it conformed most closely in its characters to the description of *Grindelia camporum*, Greene. That the drug was, in fact, *G. camporum*, has since been confirmed by Dr. Willis L. Jepson (compare P. E. F. Perrédès, Proc. A. Ph. A., 1906, 54, p. 370).

In the above-mentioned communication the isolation of the hydrocarbon hentriacontane, $C_{31}H_{64}$, and of a new phytosterol (m. p. 166° C.) were recorded, and it was also noted that the drug contained a considerable amount of *L*-glucose, together with tannin, amorphous coloring matter,

and small amounts of formic acid and an essential oil. It was, however, particularly stated that the chief constituents of *Grindelia* are amorphous resins, and with the object of more completely examining the latter, especially the portion soluble in petroleum, the investigation has been continued.

The material used in the present investigation was a further portion of the identical extract of *Grindelia* which had previously been employed. During the two years which had elapsed since this extract was first examined a portion of the chlorophyll had become altered, but otherwise it appeared to be unchanged. The extract was mixed with water and subjected to steam distillation for the removal of the volatile constituents, after which the cake of resins was separated from the aqueous liquid, and thoroughly washed. These resins were mixed with purified sawdust, the mixture dried, and extracted successively in a Soxhlet apparatus with light petroleum (b. p. 33–50° C.) and ether. The portion of the resins which remained undissolved by this treatment amounted to only about 8 per cent. of the whole. As stated in the previous paper (*loc. cit.*), this portion of the resin appeared to contain nothing crystalline, and being for the most part only soluble in alcohol, it has not been further examined.

Examination of the Petroleum Extract of the Resins.

The petroleum extract of the resins was, at the ordinary temperature, a soft, very sticky solid, but when warmed it rapidly melted to a thick, oily liquid, which was specifically heavier than water. It was dissolved in ether, and the ethereal solution shaken with 10 per cent. sulphuric acid. As nothing was removed by this treatment, the ethereal liquid was repeatedly extracted with a strong solution of sodium carbonate. The alkaline liquid thus obtained possessed a dark greenish color, and had the characters of a soap solution. It was acidified with sulphuric acid, when a sticky oil was precipitated, which was extracted with ether. On evaporating the ethereal liquid a mixture of acids was obtained, which amounted to more than one-half of the original petroleum extract, and when freed from solvent, formed an extremely sticky, soft mass. It possessed a strongly acid reaction, and could be distilled under diminished pressure without suffering decomposition, but this operation was rendered extremely difficult on account of the viscous nature of the material. The crude mixture of acids was therefore dissolved in about six times its volume of warm methyl alcohol, when, on allowing the solution to stand, it deposited a small amount of a crystalline solid. This was collected on a filter, and recrystallized from ethyl acetate, when it was found to melt at 81–82° C. It was analyzed with the following result:

0.0993 gave 0.2871 CO₂ and 0.1176 H₂O. C = 78.9; H = 13.2.
C₂₇H₃₄O₂ requires C = 79.0; H = 13.2 per cent.

This acid agrees in composition with *cerotic acid*, and is probably identical with it, although the observed melting-point ($81-82^{\circ}\text{C}.$) is somewhat higher than that recorded ($79^{\circ}\text{C}.$) for the latter acid.

The acids contained in the methyl alcoholic filtrate from this solid acid were converted into their methyl esters by passing dry hydrogen chloride into the boiling liquid for two hours. The resulting esters were isolated in the usual manner, and repeatedly submitted to a systematic process of fractional distillation under a pressure of 20 Mm., when the following fractions were collected: (I) About $150-200^{\circ}$; (II) $200-215^{\circ}$; (III) $215-225^{\circ}$; (IV) $225-230^{\circ}$; (V) $230-235^{\circ}$; (VI) $235-240^{\circ}$; (VII) $240-245^{\circ}$; (VIII) $245-250^{\circ}$; (IX) $250-260^{\circ}$; (X) $260-270^{\circ}$; (XI) above $270^{\circ}\text{C}.$ / 20 Mm.

All these fractions possessed a brownish-yellow color, although No. I, on standing, rapidly darkened. The lower fractions were fairly mobile liquids, but with the increase of temperature at which the fractions were collected their viscosity also became progressively greater, the last two fractions being sticky solids. The results of the examination of the various fractions indicated that they represented an extremely complex mixture, as will be seen by reference to the following table:

Fraction Number.	Boiling point at 20 Mm.	Weight in Grams.	Density at $20^{\circ}\text{C}.$	Specific Rotation.	Analysis C %; H %.	Iodine Value.	Saponification Value.
I	$150-200^{\circ}\text{C}.$	4.50	0.9826	+ 7.4°	75.8; 10.1	81.0	—
II	$200-215^{\circ}\text{C}.$	5.25	0.9743	+ 0.5°	78.8; 10.8	104.2	—
III	$215-225^{\circ}\text{C}.$	10.40	0.9869	— 6.9°	78.8; 10.5	103.8	7.0; 9.0 and 9.7
IV	$225-230^{\circ}\text{C}.$	8.47	1.0037	— 8.8°	78.1; 10.5	86.4	—
V	$230-235^{\circ}\text{C}.$	9.18	1.0147	— 9.1°	77.5; 10.3	72.4	10.0
VI	$235-240^{\circ}\text{C}.$	9.30	1.0312	— 10.5°	76.8; 10.2	62.9	—
VII	$240-245^{\circ}\text{C}.$	8.39	1.0432	— 8.3°	75.6; 10.6	56.2	—
VIII	$245-250^{\circ}\text{C}.$	10.22	1.0535	— 5.8°	74.0; 9.7	48.8	11.5
IX	$250-260^{\circ}\text{C}.$	9.05	1.0634	— 1.8°	74.9; 9.7	41.2	—
X	$260-270^{\circ}\text{C}.$	3.92	—	+ 2.2°	74.2; 9.8	40.3	—
XI	Above $270^{\circ}\text{C}.$	1.70	—	—	—	—	—

For the purpose of comparison the density of a fraction (b. p. $215-225^{\circ}\text{C}.$ / 20 Mm.) of methyl esters of fatty acids, consisting largely of methyl oleate, was determined, and found to be 0.8784 at $20^{\circ}\text{C}.$

Fraction I boiled over a wide range of temperature, and was obviously a mixture. The analyses of fractions II and III agree with the formula $\text{C}_{28}\text{H}_{52}\text{O}_2$, but this formula is not in harmony with the iodine value of these fractions, thus indicating them to be mixtures. The numbers obtained for the saponification value of fraction III varied considerably (7.0 to 9.7), and were all lower than the theoretical value (13.1) for an ester possessing the above formula. It was found that this was due to the fact that this fraction consisted partially of an ester which was saponified only with

great difficulty. A quantity of fraction III was therefore boiled for two hours with an excess of alcoholic potash, the alcohol removed, and the unsaponified ester isolated by means of ether. This ester was distilled under diminished pressure and analyzed :

0.1260 gave 0.3813 CO_2 and 0.1170 H_2O . C = 82.5; H = 10.3.

$\text{C}_{31}\text{H}_{46}\text{O}_2$ requires C = 82.7; H = 10.2 per cent.

On acidifying the alkaline liquid from which this ester had been removed an acid was precipitated, which, when isolated by means of ether, was obtained as a very thick oil. It deposited, on standing, a trace of crystalline substance, and this, after being collected and recrystallized, was found to possess the properties of *palmitic acid*. Fraction III was, therefore, a mixture of esters.

The results obtained by the analysis of fraction V agree with the formula $\text{C}_{25}\text{H}_{40}\text{O}_3$. The saponification value (10.0) is also in harmony with this formula ($\text{C}_{25}\text{H}_{40}\text{O}_3$ requiring 10.3), whilst the iodine value (72.4) is not far removed from that required for an ester $\text{C}_{25}\text{H}_{40}\text{O}_3$ containing one double linking, namely, 65.5. It therefore appears probable that an acid possessing a formula approximating to $\text{C}_{24}\text{H}_{38}\text{O}_3$ is present in *Grindelia*, and as this acid contains only one double linking, it may be assumed that a benzene nucleus is also present in its structure. In view of this consideration a quantity of the ester was oxidized by means of a chromic acid mixture, with the hope of isolating a known benzene derivative from the products, but only resins were obtained. The acid produced by the hydrolysis of fraction V was an extremely viscous liquid, and nothing crystalline could be obtained from it. Fraction VI was evidently similar to the preceding one, whilst the fractions of higher boiling-point, although obviously mixtures, would appear to contain esters of more highly oxygenated acids. It is evident from a consideration of the iodine values of the above fractions of esters, together with the amount of hydrogen which they respectively contain, that cyclic compounds must be present in each of them.

The original ethereal liquid, which, after extraction with sodium carbonate, still contained the non-acidic constituents of the petroleum extract, was shaken with a 10 per cent. solution of potassium hydroxide. This treatment removed nothing, but on washing the ethereal liquid with water, after separating the alkaline solution, a deep green, aqueous liquid was obtained. This evidently contained that portion of the chlorophyll which had been present in the petroleum extract. It was separated from the ethereal liquid, acidified with sulphuric acid, and extracted with ether, when, on removing the solvent, a quantity of a bright green, resinous substance was obtained. This product, which consisted of chlorophyll, evolved ammonia when boiled with alcoholic potash, and since none of the other constituents of the petroleum extract contained nitrogen, it must

have been the source of the ammonia which, as noted in the previous communication (*loc. cit.*), was evolved in considerable amount on boiling the entire petroleum extract with the alcoholic alkali.

The ethereal liquid, which now no longer contained any acidic or phenolic substances, was dried, and the ether removed. The residual fatty matter was dissolved in alcohol, and boiled for two hours with an excess of an alcoholic solution of potassium hydroxide. The alcohol was then removed, water added, and the resulting liquid repeatedly extracted with ether. During the first extraction a small quantity of a flocculent precipitate accumulated in the lower portion of the ethereal layer. This solid was collected on a filter, well washed with warm ether, and dried. On examination it was found to be the potassium salt of a fatty acid, for, when treated with sulphuric acid, it afforded an acid which crystallized from ethyl acetate in leaflets melting at 84°C . This was analyzed with the following result:

0.1119 gave 0.3245 CO_2 and 0.1340 H_2O . $\text{C} = 79.1$; $\text{H} = 13.3$.
 $\text{C}_{27}\text{H}_{54}\text{O}_2$ requires $\text{C} = 79.0$; $\text{H} = 13.2$ per cent.

This substance appears to be identical with the acid melting at $81\text{--}82^{\circ}\text{C}$., previously obtained, and is presumably *cerotic acid*, although the possibility of its being a higher homologue of the latter is not excluded.

The product obtained on evaporation of the ethereal extracts of the alkaline liquid was shown in the previous communication to contain hentriacontane, $\text{C}_{31}\text{H}_{64}$, and a small amount of a phytosterol (m. p. 166°C .). On submitting this product to fractional distillation under diminished pressure, evidence has now been obtained that a small quantity of a hydrocarbon other than hentriacontane is also present. This second hydrocarbon melts at a temperature lower than that at which the one previously isolated fuses, but it could not be isolated in a state of purity. The alkaline liquid from which the unsaponifiable matter had been removed was acidified with sulphuric acid, and the acids which separated were extracted by means of ether. The ethereal solution of these acids was evaporated to a small bulk, and a considerable volume of light petroleum then added, which caused the separation of a small amount of a brown, resinous product. This product, from which the clear liquid was decanted, was heated with methyl alcohol and dry hydrogen chloride, when it afforded a little resin and a viscous mixture of esters resembling the higher fractions of the esters obtained from the free acids previously described. The clear petroleum liquid was evaporated, and the residual acids converted into their methyl esters in the manner above described. The product thus obtained was not nearly so large in amount as the esters prepared from the free acids, but resembled the latter esters in its general properties. It was distilled under a pressure of 20 Mm., when the following fractions were collected: (I) Below 210° ; (II) $210\text{--}230^{\circ}$; (III) $230\text{--}240^{\circ}$; (IV) $240\text{--}250^{\circ}$; (V) $250\text{--}260^{\circ}$; (VI) above 260°C . / 20 Mm.

Fractions II, III, and IV were the largest, the remainder being only small in amount. The specific rotations of these three principal fractions varied from $[\alpha]_D -20.0^\circ$ to -22.6° , and their densities from 0.9422 to 0.9844 at 20°C . All the fractions were obviously mixtures, and appeared to contain esters similar to those prepared from the free acids. On analysis, fraction II gave $\text{C} = 76.3$; $\text{H} = 11.1$ per cent., and when hydrolysed it yielded an oily acid, which, on standing, deposited a small quantity of a crystalline solid. This substance was separated and re-crystallized, after which it melted at 62°C ., and appeared to be identical with the solid acid obtained from fraction III of the esters of the free acids. The amount of crystalline acid isolated in this latter case was, however, rather larger than that previously obtained. It was analyzed with the following result:

0.1069 gave 0.2968 CO_2 and 0.1211 H_2O . $\text{C} = 75.7$; $\text{H} = 12.6$.

$\text{C}_{16}\text{H}_{32}\text{O}_2$ requires $\text{C} = 75.0$; $\text{H} = 12.5$ per cent.

$\text{C}_{18}\text{H}_{36}\text{O}_2$ requires $\text{C} = 76.1$; $\text{H} = 12.7$ per cent.

This crystalline solid would, therefore, appear to be a mixture of *palmitic* and *stearic acids*.

Examination of the Ether Extract of the Resins.

When the resins no longer yielded anything to petroleum they were submitted to a prolonged extraction with purified ether. The entire ethereal solution thus obtained was concentrated to the volume of about one litre, and this liquid allowed to stand over night, when it deposited a small amount of a black, tarry resin, together with a little of a substance in the form of crystalline plates. The dark-green liquid was then decanted from the resin, and the crystalline substance collected on a filter and washed with ether. The small amount of black resin also contained a little of this crystalline substance, but nothing else could be isolated from it. The crystalline compound was insoluble, or nearly so, in most solvents, but could be dissolved in a moderate volume of boiling glacial acetic acid, from which it separated in handsome, crystalline plates, melting at $256-257^\circ \text{C}$. On analysis it gave the following result:

0.1033 gave 0.2755 CO_2 and 0.0951 H_2O . $\text{C} = 72.7$; $\text{H} = 10.2$.

$\text{C}_{17}\text{H}_{30}\text{O}_2$ requires $\text{C} = 72.9$; $\text{H} = 10.0$ per cent.

$\text{C}_{23}\text{H}_{38}\text{O}_4$ " $\text{C} = 73.0$; $\text{H} = 10.1$ per cent.

The amount of this substance obtained from 2500 Gm. of *Grindelia* extract (representing 7353 Gm. of the air-dried drug) was only about 0.2 Gm., and it was therefore impossible to decide which of the above two formulas should correctly be assigned to it, but apparently it is not identical with any substance hitherto described. When treated with sodium methoxide and methyl iodide, it did not undergo methylation, but on boiling with

acetic anhydride it yielded an *acetyl derivative*, and was, therefore, an alcohol. This acetyl derivative, when separated from anhydrous solvents, was obtained in the form of a jelly, but, on cooling its solution in dilute alcohol or in dilute acetic acid, it formed colorless needles, which, after drying at 100°C ., melted at 161°C .

The filtered ethereal solution of the readily soluble constituents of the ether extract of the resins was subsequently extracted with successive portions of a strong solution of sodium carbonate so long as anything was removed by this treatment. The first two or three shakings with alkali yielded rather thick, dark brown liquids, which, when acidified and extracted with ether, afforded a large quantity of a brown resin. This product represented by far the greater part of the ether-soluble portion of the resins, but nothing crystalline could be obtained from it. The aqueous liquids obtained by all the subsequent extractions with alkali were not mixed, but were separately examined. Each of them, on standing, separated into two layers, the lower of which was a clear, yellowish-brown liquid, whilst the upper one was rather thick, and dark greenish-brown in color. All the dark colored aqueous liquids, on acidification, afforded only resins, but the examination of the clear, yellowish liquids was attended with a different result. The material obtained on acidifying the first two of these yellowish-brown liquids consisted only of a little resin, but each of the remaining seven or eight portions of alkaline liquid, when acidified, afforded a small amount of a product which, when dissolved in ethyl acetate, and the solution allowed slowly to evaporate, gave a little of a yellow, crystalline solid. This *substance* was collected on a filter, washed with ethyl acetate, and then recrystallized from this solvent, when it was obtained in tufts of yellow prisms which melted at $227\text{--}228^{\circ}\text{C}$. On analysis the following results were obtained :

0.0998 gave 0.2358 CO_2 and 0.0409 H_2O . $\text{C} = 64.4$; $\text{H} = 4.6$

0.1042 gave 0.2473 CO_2 and 0.0449 H_2O . $\text{C} = 64.7$; $\text{H} = 4.8$

$\text{C}_{14}\text{H}_{12}\text{O}_5$ requires $\text{C} = 64.6$; $\text{H} = 4.6$ per cent.

This substance appears to be of a phenolic nature, and, as far as can be ascertained, it is not identical with any compound heretofore described. A small quantity of it was boiled with acetic anhydride, when it underwent acetylation. The resulting *acetyl derivative* was crystallized twice from ethyl acetate, when it formed pale yellow, needle-shaped crystals, which melted at 154°C .

The ethereal liquid, from which the above-mentioned yellow, phenolic substance had been extracted by means of sodium carbonate, was shaken with a 10 per cent. solution of potassium hydroxide, but this yielded a dark greenish-brown liquid from which only a little resin could be obtained. The remaining ethereal liquid, after being washed with water, which removed a little chlorophyll, was dried, and the ether removed.

The residue was small in amount, and consisted of a soft, bright green resin, from which nothing crystalline could be obtained.

SUMMARY AND CONCLUSIONS.

From this investigation it is seen that that portion of the *Grindelia* resins which is soluble in petroleum consists, to a large extent, of a complex mixture of liquid *acids*. These acids are, for the most part, optically active, unsaturated cyclic compounds. Some of them are oxy-acids and appear to contain benzene nuclei. A very small amount of *cerotic acid*, and apparently a trace of palmitic acid, are also present in *Grindelia*. The large amount of ammonia which, as stated in our previous communication (Proc. A. Ph. A., 1905, 53, p. 197), was evolved on boiling the petroleum extract of the resins with alcoholic potash, is now shown to have been derived from the chlorophyll present in this extract.

The non-acidic portion of the petroleum extract was previously shown to contain a new *phytosterol* (m. p. 166° C.) and the hydrocarbon *hentriacontane*, $C_{31}H_{64}$, whilst evidence has now been obtained that a small amount of another *hydrocarbon* is also present. It consists, however, for the most part, of a complex mixture of esters, presumably *glycerides*. The acids obtained by the hydrolysis of these esters possessed a considerable degree of optical activity, and appeared to be similar to those which occur in a free state, but the only products that could be isolated from them were small amounts of *cerotic acid*, and a mixture of *palmitic* and *stearic acids*.

The ether extract of the resins consists, to a very large extent, of a mixture of amorphous products, but very small amounts of a *colorless crystalline alcohol* and a *yellow substance of phenolic nature*, both of which are apparently new compounds, were obtained from it. The alcoholic body possesses either the formula $C_{17}H_{28}O_3$ or $C_{23}H_{38}O_4$. It crystallizes in plates melting at 256–257° C., and yields an acetyl derivative melting at 161° C. The yellow phenolic substance crystallizes in prisms melting at 227–228° C., and possesses the formula $C_{14}H_{12}O_5$. It gives an acetyl derivative melting at 154° C.

All the crystalline substances which have been isolated from the *Grindelia* resins, with the exception of the hentriacontane, occur in exceedingly small amounts, and their isolation in quantities sufficient for examination has only been rendered possible by the employment of large quantities of material.

Mr. Searby moved to receive the paper and refer for publication, and the motion prevailed.

At request of the Chair, Mr. Henry Kraemer then gave an abstract of the following paper on "*Aspidium Marginale* and *Osmunda Claytoniana*," exhibiting some specimens of the plants discussed :

ASPIDIUM MARGINALE AND OSMUNDA CLAYTONIANA.

BY HENRY KRAEMER.

The rhizomes of a number of ferns¹ have been used in medicine since ancient times. Of these, that of *Aspidium Filix mas* is probably the most valuable, and is official in most of the pharmacopœias. It is, however, only a little more than thirty years since the rhizome of the closely related American species, *Aspidium marginale*,² was first subjected to analysis. The drug from this source was subsequently examined by Cressler³ and Kennedy,⁴ and recommended by Maisch,⁵ for introduction into the U. S. Pharmacopœia, becoming official in the 1880 edition. The rhizome and stipes having been found to have properties similar to those of *Aspidium Filix mas*, were probably introduced with a view of encouraging the collection of the American drug, and probably also with a view of obtaining the drug in a fresh condition.

While the crude drug dealers mostly list only the foreign drug, and the filicic acid on the market is said to be derived from plants of *Aspidium Filix mas* growing in Europe, there are indications that attempts are made to collect the drug in this country. The collectors, however, do not always seem to be able to distinguish *Aspidium marginale* from others of our native ferns, and in several recent instances the drug purchased for *Aspidium* has proved to be the rhizome of *Osmunda Claytoniana*, a plant belonging to a different family of ferns.

As far as I am aware the literature does not contain a record of *Osmunda Claytoniana* being used in medicine. Dragendorff⁶ mentions that the stipes and peeled rhizome of plants of *Osmunda regalis* growing in middle and southern Europe are used as a mild purgative and vermifuge. He also states that *Osmunda spectabilis** of North America is said to be used in phthisis. It thus appears that no species of *Osmunda* has been used to any considerable extent in medicine.

In view of the frequency with which the aspidium on the American drug market is admixed with the rhizome of *Osmunda Claytoniana*, my purpose is to describe this plant and *Aspidium marginale* and to give the distinguishing characters of the parts collected as drug.

ASPIDIUM MARGINALE.

Aspidium marginale, known also as evergreen wood-fern, marginal shield-fern or rock-fern, is confined to North America, extending from Newfoundland to South Carolina and Arkansas, and is said to be fairly abundant over the area of its distribution. It grows in dry, rocky localities, being often found in the crevices of quartz and granitic rocks which

* It may be stated in this connection that some botanists regard the American plant known as *Osmunda spectabilis* as a distinct species, while others regard it merely as a form of *Osmunda regalis*.

contain a small amount of soil, and is also reported to prefer the northern and eastern portions of the hills on which it is found. The plant is an evergreen, as indicated by one of its common names, and is one of the most beautiful of the fern group. It has long been listed by nurserymen and sold as an ornamental plant, being adapted to shady situations.

The fronds are from 25 to 60 Cm. or more long, and occur in circles or crowns of six or more at the growing end of the rhizome. They are oblong-lanceolate in outline, acuminate, and slightly narrowed at the base. They are pinnate above and bi-pinnate below. The pinnæ or main divisions of the frond, are oblong-lanceolate, acuminate, and slightly narrowed at the base, thus resembling the frond in general outline. The pinnules, or smaller divisions are oblong, slightly falcate, more or less rounded at the apex, broad at the base and confluent with the winged rachis, the lower ones being slightly auriculate, and varying from nearly entire to crenulate or wavy-toothed. They are dark or bluish-green on the upper surface and lighter, and chaffy or scaly on the under surface. They are rather firm in texture and by some authors are described as sub-coriaceous. The primary veins of the segments or pinnules are undulate, purplish in color, and fork once or twice, forming curved veinlets which end free. The sori or fruit bodies are situated close to the margin on the under side of the pinnules, hence the name *marginale*, and are covered with kidney-shaped indusia which are attached at the sinus, and which in the younger stage are white or lead-colored, giving the frond a very striking and characteristic appearance. Unlike the sori of *Aspidium Filix mas*, they are distributed throughout the length of the pinnæ on which they occur, and over about two-thirds of the frond extending to the apex.

The rhizome, stipes and chaffy scales of *Aspidium Filix mas* have been described both morphologically and histologically by Tschirch,¹ and the corresponding parts of *Aspidium marginale* are more or less similar. The rhizome of the latter plant varies from 1 to 10 Cm. in length. Only a very small part of the rhizome however—that near the growing point—contains chlorophyll, and thus with the rejection of the older brown parts and the chaff the active drug constitutes a small proportion of the original rhizome and stipes.

The stipes or basal portions of the stalks are dark brown in color and covered with a brown chaff. In cross-section they are somewhat elliptical and slightly angular or winged on two of the opposite sides. Internally they are light green, and contain from five to eight fibro-vascular bundles of the concentric type with the xylem interior, and each bundle with its own endodermis, as is frequently the case in ferns. In addition to the parenchyma cells, which contain starch and fixed oil, there are numerous cells with internal glandular hairs having a short stalk and large glandular head. The brown outer portion, consisting mostly of about ten rows of cells, constitutes the hypodermal layer. These cells have a

brownish-black cell-wall, which is relatively thin. In long section they are oblong and oblique or angular at the ends, and from 0.4 to 0.5 Mm. in



Plant of *Aspidium Marginale*, with all except four of the fronds removed.

length. The hypodermal layer in the upper portion of the stipe is covered by an epidermal layer.

The chaff consists of thin, translucent, brownish scales, which are from 5 to 20 mm. in length, and vary from long linear-lanceolate to oblong-lanceolate, the upper portion being frequently considerably contracted or narrowed. The margin of the younger and narrower scales is nearly entire, but the older ones have a few runcinate teeth in the lower portion. The tissue consists for the most part of two layers of cells, which are about 0.035 Mm. in width and 0.350 Mm. in length, and have oblique ends, those near the teeth being curved and longer. The walls of the cells are thin and yellowish-brown, and the contents consist of granular cytoplasm and a single spherical nucleus. Many of the cells contain brownish masses in addition.

The roots are delicate and thread-like, blackish-brown, somewhat branched, and appear to arise near the bases of the stipes. In cross section three distinct zones are observed: An outer one about 0.150 Mm. in diameter, composed of hexagonal, tangentially elongated cells having dark-brown, thin walls and containing a small amount of cytoplasm; a middle zone or layer having the same width and composed of polygonal, thick-walled cells with narrow lumen, the inner lamellæ being deep reddish-brown and with difficulty distinguished from the contents; and a central cylinder about 0.300 Mm. in diameter and consisting of a diarch fibrovascular bundle, pericambium and endodermis, as in most of the other ferns.

OSMUNDA CLAYTONIANA.

Osmunda Claytoniana (Clayton's Fern or Interrupted Fern) has nearly the same habitat as *Aspidium marginale*, being found from Newfoundland southward to North Carolina and westward to Minnesota and Missouri. It is also said to grow in India. This fern is sometimes found in low grounds in alluvial soil, but usually prefers a dryer situation along wooded hills or fence rows, and thrives well when grown for ornamental purposes.

The fronds vary in length from 30 to 90 Cm., sometimes attaining a height of 2 M., and occur in groups of eight to twelve or more. In this fern as in others of the Osmundaceæ, the spore-bearing or fertile fronds are distinct in character. They are more or less erect, curving slightly at the top, occupy the center of the group in the mature stage, and are taller than the sterile fronds. These latter form an outer circle, and are spreading. The fronds are oblong-elliptical in outline, being slightly narrowed at the base, and 2-pinnatifid throughout. The pinnæ are oblong, rounded or acute, but never acuminate, at the apex, and deeply pinnatifid. The pinnules or segments are oblong, confluent at the base, and rounded at the apex, the margin being entire or obscurely crenulate toward the apex. They are light or yellowish-green and later turn brown, showing the effects of injury very readily and soon wilting after being collected. In texture they are thin and delicate. The primary veins of the pinnules are straight and

pinnately branched, the branches forking once near the primary vein, and running obliquely to the margin. In the fertile fronds from two to five pairs of the pinnæ near the middle of the frond are considerably contracted and bear the sporangia or spore cases. They are at first green, but later



Plant of *Osmunda Claytoniana*, showing long rhizome and three of the sterile fronds.

acquire a dark-brown color. The spores are also green at first, but afterwards turn brown, and are said not to germinate after they lose their green color.

The rhizome is nearly horizontal and varies in length from 10 to 30 Cm. When deprived of the stipes and roots it is quite slender, being from 2 to

3 Mm. thick. As usually seen however it is quite stout, being closely covered with the flattened, broadly winged, imbricated stipe bases, which are free from chaff, and by the roots which are cylindrical on the lower side of the rhizome, but more or less flattened when they arise above, sometimes growing up through the stipe bases. The bud is characteristic,



Longitudinal Section of the Rhizome of *Osmunda Claytoniana*
showing the growing point at the anterior end.

resembling that of *Podophyllum*. It is very mucilaginous, and it is said to be edible as are also the buds of *Osmunda regalis* and *Osmunda cinnamomea*.

In transverse section the rhizome is seen to be composed of a circular, nearly central pith, which is surrounded by a continuous layer of xylem about 0.5 Mm. in diameter and composed of scalariform ducts. The associated sieve tissue occurs in groups which are convex on the exterior.

Bounding this stratum is a layer of endodermal cells, which in turn is surrounded by parenchyma containing starch. Next to the parenchyma on the outer side is a dark reddish-brown layer composed of sclerenchyma fibers. In this layer occur yellowish circular areas representing the stipe bases. These areas are occupied for the most part by concentric fibrovascular bundles with the xylem interior, and around which are rather large irregular cells containing tannin or a tannin-like substance.

The stipes in cross section are distinguished by a single large fibrovascular bundle which is involute, that is, both margins are rolled inward towards the rhizome (see Fig.). In the central portion of the bundle are several layers of reticulate tracheæ, on either side of which the sieve is arranged in several layers. Surrounding the phloem in a continuous layer are several rows of narrow, comparatively thick-walled and strongly lignified sclerenchymatic fibers. The fibrovascular bundle is embedded in a parenchyma tissue, the cells of which are somewhat rounded or polygonal, and between which are large triangular intercellular spaces. The parenchyma cells have rather thick cellulose walls and contain a network of cytoplasm in which a large nucleus is found. Beneath the epidermis is a hypodermis consisting of twelve rows of cells which are rather thick-walled and strongly lignified. The lower winged portion of the stipes is elliptical in cross section, and while the fibrovascular bundle in this portion is the same shape as in the upper portion, the cells of the parenchyma and hypodermal layer are reduced on the posterior and anterior faces of the stipe.

The roots have a small central diarch fibrovascular bundle about 0.500 Mm. in diameter. Around this bundle is a row of tangentially elongated cells containing starch grains and a dark reddish-brown tannin-like substance. These cells resemble those of the hypodermis, except that they are larger. The greater portion of the root consists of large parenchyma cells which are polygonal in cross section, and contain numerous starch grains which vary from 0.005 to 0.015 Mm. in diameter.

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1. Flückiger and Hanbury: *Pharmacographia*, p. 733.
2. Patterson: *Am. Jour. Pharm.*, vol. 47 (1875), p. 292.
3. Cressler: *Am. Jour. Pharm.*, vol. 50 (1878), p. 290.
4. Kennedy: *Proc. A. Ph. A.*, vol. 28 (1880), p. 462.
5. Maisch: *Am. Jour. Pharm.*, vol. 50 (1878), p. 292.
6. Dragendorff: *Die Heilpflanzen*, p. 60.
7. Tschirch: *Anatomischer Atlas der Pharmakognosie und Nahrungsmittelkunde*, 1900.

Mr. Sayre moved to receive the paper to take the usual course.
Carried.

The next paper called for was one upon "Gelsemine," by Mr. Sayre. Mr. Sayre presented his paper in abstract, the following being its full text:

A STUDY OF THE ALKALOIDS GELSEMINE AND GELSEMININE.

BY L. E. SAYRE, UNIVERSITY OF KANSAS.

It has been the effort of the writer during the past year to investigate two alkaloids alleged to exist in the root of *Gelsemium Sempervirens*, which have been named respectively gelsemine and gelseminine; and incidentally to carefully separate and study the so-called gelsemic acid, which has been reputed by Schmidt to be methyl-aesculetin. We can report at this time the accomplishment of only a certain measure of progress in the work. A brief review of the history of the constituents of gelsemium, leading up to those named, may not here be out of place. The first analysis of this drug, showing the presence of alkaloid, was made by M. H. Kolloch in 1855, and since then there have been several examinations made by different chemists: Eberly and Wormley,* 1869, Gerrard,† 1883, Chas. Robbins,‡ L. Sonnenschein,‡ and later by Thompson,§ Lloyd, and others.

The earlier investigators obtained the gelsemic or gelseminic acid by two different processes: Wormley obtained it from the acidulated fluid extract from which extraneous matter had been precipitated by water, washing the concentrated fluidextract with ether and allowing the ether to evaporate. Robbins obtained it from a hydroalcoholic concentrated extract; adding to this lead acetate, filtering and suspending the precipitate in water and adding hydrogen sulphide to decompose the lead, filtering and shaking the filtrate out with ether. Ether solution on evaporating left needle-like crystals of a red color, which were recrystallized from absolute alcohol. This product Robbins claims to have a melting-point of 160° C. Gelsemic acid when shaken with nitric acid takes on a yellow color, which changes to a deep blood-red on adding ammonia. The reaction is very delicate, .00002 Gm. giving a distinct reaction. Potassium, sodium or ammonium hydroxides added to the acid cause it to become quite yellow and form with it highly fluorescent solutions.

Robbins || claims gelsemic acid to be identical with aesculin. Dragen-dorff and Schmitz also believe with Robbins that gelsemic acid is identical with aesculin. Wormley,¶ on reinvestigating this matter, gives five reasons for believing that gelsemic acid is different from aesculin. Coblenz ** confirms Wormley's results, claiming that gelsemic acid is not a glucoside and will not hydrolyze, upon boiling, into a substance giving

* American Journal Pharmacy, 1870, page 1.

† American Journal Pharmacy, 1883, page 256.

‡ Berichte Der Deutschen Chem. Ges., 1876, page 1182.

§ Pharm. Era, Jan., 1887, page 3.

|| Ber. Der Deutschen Chem. Ges., 1876, 1182.

¶ A. J. P., July, 1882.

** Proc. A. Ph. A., 1897, 224.

the characteristic needle-shaped crystals with phenylhydrazin. E. Schmidt claims gelsemic acid is identical with scopoletin, and is also identical with methylaesuletin.

As to the alkaloidal constituents of gelsemium, up to the year 1876 it was believed by Sonnenschein and others that the alkaloidal constituency of the root was embraced in the one body which was uncrystallizable. The investigators to whom we are indebted for the earlier work were as follows :

Eberle, 1869, Wormley, 1869,* Robbins,† Sonnenschein, 1876,‡ Gerrard, 1883.

It was not until 1887 that F. A. Thompson, investigating the nature of the alkaloid gelsemine, found it to consist of two alkaloids: these he named gelsemine and gelseminine respectively. A concise statement of his method of extraction and separation is as follows: The finely-powdered drug was mixed with $\frac{1}{6}$ of its weight of freshly slaked lime and exhausted with strong alcohol. The alcoholic percolate was rendered slightly acid with dilute sulphuric acid. The lime removed as a sulphate by filtration. The alcoholic filtrate was concentrated, and to the concentrate water was added as long as any precipitate was produced. The solution after standing 24 hours, the author states, separates into two strata, the upper being mostly gelsemic acid, and the lower mostly the alkaloids in the form of a salt. Separation from the sediment was effected by drawing off the liquid portion and washing the deposit of organic acids with water; this solution was concentrated and washed with several portions of ether to remove gelsemic acid.

The fluid, containing the alkaloids, was washed with three or four times its volume of chloroform in a separatory funnel to remove traces of gelsemic acid. The remaining liquid was made alkaline and shaken out with chloroform. The chloroformic solution resulting therefrom was washed out with water containing sulphuric acid. The solution of the alkaloidal sulphates as thus obtained was quite dark, due to the presence of a soft, or second, alkaloid.

To further purify the alkaloids they were again precipitated with an alkali and dissolved out with ether, and from the ethereal solution were removed by shaking with water containing hydrochloric acid, thus converting the alkaloidal material into hydrochloride. The solution of the hydrochlorides deposited upon standing a crystalline alkaloidal salt, which he named gelsemine chloride. This, being insoluble in water, was deposited out of the solution, while the chloride of the second alkaloid, being soluble in its own weight of water, was held in solution, and by

* American Journal Pharmacy, 1870, page 1.

† Ber. der Deut. Chem. Ges., 1876, page 1182.

‡ Ber. der Deut. Chem. Ges., 1876, page 1182.

filtering, the two alkaloids were fractionally separated. The gelsemine chloride was then further purified by repeated crystallization from hot alcohol until a perfectly white crystalline salt was obtained.

Mr. Thompson studied the ultimate composition of the organic base in the form of a chloride, and ascribes to it the following chemical formula : $C_{64}H_{89}N_4O_4(HCl)_3$, giving its chemical reactions whereby it may be identified, most prominent and characteristic of which being : A mixture of strong sulphuric acid with a little manganic oxide rubbed with a glass rod produces with gelsemine a deep crimson-red, passing to green. This reaction is so delicate that it can be demonstrated with a solution of 1 in 100,000. If this reaction be performed upon the pure alkaloid the color may be sufficiently intense to cause it to be mistaken for strychnine, but if a parallel experiment be carried on with strychnine the two alkaloids cannot be mistaken, for the strychnine gives an intense purple, passing to red.

L. Spigel, in Ber. 26-1054, says that experiments intended to establish the formula for gelsemine (known in Germany as gelseminine) as between $C_{64}H_{89}N_4O_4$ (Gerrard) and $C_{27}H_{28}N_4O_8$ have not led to a decisive conclusion, yet the results of analyses agree more closely with the latter formula.

For the purpose of the further study of organic constituents by the author, five pounds of fresh rhizome and roots, minutely comminuted, were macerated with alcohol for several months and then transferred to a percolator and the extraction finished with the same menstruum. The alcoholic tincture was concentrated to a syrupy consistency, water was added, and the precipitate filtered off and washed. The filtrate, which was acid in reaction, was treated with lead acetate, the mixture filtered, and the filtrate from this treated with lead subacetate ; this was filtered, and the filtrate treated with dilute sulphuric acid and again filtered. This third filtrate was shaken out with chloroform until the so-called gelsemic acid was supposed to be practically removed. The chloroformic solution on evaporation deposited on the sides of the vessel masses of crystals mixed with coloring matter. These on dissolving in hot alcohol after filtration and evaporation deposited perfectly colorless needle-shaped crystals. These were drained on a porcelain tile and freed from extraneous matter. They were then identified as the so-called gelsemic acid by the reaction with nitric acid and ammonia, which gave the characteristic blood-red color. The melting-point of these purified crystals was found to be 197.5° C. It may be observed at this point that Robbins' * gelsemic acid melted at 160° C., and Coblenz † claims this acid to melt at 206° C.

In order to determine whether the gelsemic acid contained in the lead precipitates as lead gelsemate, if such a term be permissible, the lead pre-

* Ber. der Deut. Chem. Ges., 1876, p. 1182.

† Proc. A. Ph. A., 1897, p. 225.

precipitate was suspended in water, treated with hydrogen sulphide, filtered, the filtrate concentrated, and the concentrated filtrate washed with ether. On the evaporation of the ether yellowish crystals were obtained. So persistently adherent was this yellowish resinous coloring matter that it was extremely difficult to get rid of by recrystallizations from alcoholic solution, animal charcoal, etc.

The purest crystals, we were thus able to obtain melted at 195° C.

The acid aqueous solution (which had been practically freed from gelsemic acid) after treatment with chloroform, was now neutralized by means of ammonia and again shaken with chloroform until the alkaloid was thoroughly extracted. The resulting chloroformic solution was then washed with one per cent. sulphuric acid until the washings ceased to be alkaloidal in reaction. This aqueous solution, containing the sulphate, was then made alkaline with ammonia and again shaken out with chloroform. The resulting chloroformic solution was finally treated with five per cent. hydrochloric acid. In this solution should be found the gelsemine and gelseminine chloride. In concentrated form it was of a garnet-red color, in diluted form of a bright yellow.

The highly colored solution on evaporation at a low heat, deposited in the bottom and center of the evaporating dish a nearly white, amorphous, or granular appearing mass. Around the edge and upper stratum, below the rim of the dish was a dark red, but uncrystallizable residue. Under the microscope the whitish portion was found to be composed mostly of acicular crystals. The red and white portions, each, when separately dissolved in acidulated water and treated with Mayer's reagent gave a precipitate, but they were of a slightly different character. The white portion gave a somewhat light, granular precipitate, while the red gave a heavy curdy one. The white portion, containing the acicular crystals, was suspected of containing some ammonium chloride (or ammonium compound with organic acid) which salt seems to adhere very closely, and difficult to remove without loss of alkaloid as was noted in my paper last year (Proc. A. Ph. A. '06, p. 385). It was carefully washed upon a filter with small portions of water, which, while it removed the ammonium salt also removed some alkaloid. The residue, left in the filter, was not now colorless, nor crystalline. When dissolved in alcohol and still further purified from absolute alcohol no crystals were obtained, but, on the contrary, a residue of a yellow color and amorphous, tending toward crystallization. This residue gave the characteristic test for gelsemine. Sulphuric acid and manganic oxide produced a deep crimson-red slowly passing into emerald-green.

Still further purification of this gelsemine chloride was attempted by dissolving the above-mentioned deposit in water, precipitating the alkaloid by Wagner's reagent, collecting the bulky precipitate on a filter, and washing the periodides with water. The precipitated periodides were then

decomposed by a five per cent. solution of sulphurous acid. The resulting solution, after filtration, was made alkaline and shaken with chloroform. The chloroformic solution, before washing with acidulated water was shaken with distilled water to remove excess of ammonia. The aqueous washings gave alkaloidal reaction, showing that in removing this alkali a loss of alkaloid was sustained. The chloroformic solution was now washed with three per cent. hydrochloric acid, and the aqueous solution carefully concentrated. The deposit of alkaloid salt was still colored as before. It was dissolved in alcohol and again evaporated. An amorphous yellowish mass, with perhaps a tendency to crystallization, was left behind. It seemed conclusive that the white crystals formerly obtained were due to the presence of impurity, a constituent of which was ammonia. This much seems true that the yellow coloring matter is either exceedingly persistent or it is associated with the alkaloid itself. Treating the alkaloidal salt with animal charcoal does not remove it.

The results of this study have emphasized the fact that the so-called gelsemic acid, contrary to statements of early investigators, is only scantily precipitated by lead acetate and subacetate. This æsculin-like principle is so persistent that the residual solution, after lead precipitation, contains a measurable quantity of the principle. The results have, in addition, shown that the same results as Thompson* obtained (by the use of lime in removing the plant acids) cannot be obtained by the use of lead. That is, the gelsemine chloride, in colorless crystalline form, is not obtainable by the lead process. It is to be noted, however, that the fresh drug was employed in the present study. I hesitate to suggest that gelsemine as described by Thompson may be absent in the fresh root. It will require further study to remove the doubt that this distinct principle exists only in the dry root. The existence of two alkaloids in gelsemium, having the properties described by Thompson and others, not having been fully accepted by some authorities, is worthy of further study. With a view to a verification of their existence, and whether they exist in the fresh as well as the dry drug, a future opportunity, it is hoped, will allow me to determine, by following strictly the Thompson process.

Mr. Sayre also presented in abstract his paper on assay on gelsemium :

ASSAY OF PREPARATIONS OF GELSEMIUM.

BY L. E. SAYRE.

In the study of gelsemium it has been noted that in its assay for alkaloidal strength many of the processes waste the alkaloid or active principles, and it is exceedingly difficult to select one that will give uniform and maximum results.

In our determinations reported last year (see Proc. A. Ph. A., p. 384,

* Pharm. Era, Jan., 1887, p. 3.

1906), which had to do with the assay of the drug itself, it was stated that the volumetric method of estimating the alkaloid in every case gave results which were not only much lower than the weighing of alkaloidal residues, but were much less uniform; this was partly due perhaps to the unsatisfactory behavior of the indicator (hæmatoxylin) employed.

During the past year the various short assay processes of Lyons (Assay of Drugs, p. 161-163) were tried, also the process of Farr and Wright, which aims to purify the alkaloid by precipitating the acid solution of it by an excess of Wagner's reagent and treating the alkaloidal precipitate with a 5 per cent. solution of sulphurous acid until the alkaloidal periodide is wholly decomposed. The solution, made alkaline with ammonia, is shaken with three successive portions of chloroform (10, 10 and 5 Cc.), then, the chloroform evaporated, the residue dried at 100° C. and weighed. Unfortunately the process of Farr and Wright, while it gives uniform results, is too complicated for ordinary usage.

A process, for which I am indebted to Mr. L. D. Havenhill, my associate, who has taken up the study with me, is as follows: Take, for example, the fluidextract of the drug for assay:

Take 15 Cc. of the fluidextract and evaporate at 60° C. to a soft extract, or sufficiently to expel the alcohol. Add 5 Cc. of normal sulphuric acid, which has been previously diluted with an equal volume of water, and allow the resulting mass to disintegrate. When thoroughly disintegrated transfer to a 15 Cc. graduated cylinder and complete the dilution to 15 Cc. Mix thoroughly, and allow the precipitate to settle (the addition of a little purified talcum will sometimes be necessary), filter or decant off 10 Cc. into a separatory funnel and wash the acid solution with chloroform, using 3 portions (10, 5, 5 Cc.), wash the united chloroformic washings with about 5 Cc. of slightly acidulated water. Unite the acid solution; make the mixture alkaline with ammonium hydroxide, and shake out with chloroform, using 3 portions (15, 10 and 5 Cc.). A fourth portion of 10 Cc. may sometimes be necessary to extract all the alkaloid before it ceases to give alkaloidal reaction with Mayer's reagent. Evaporate the chloroformic solution to constant weight, and weigh as crude chloroform-soluble gelsemium alkaloids.

This process gives very satisfactory and uniform results. It is possible to further purify the alkaloids without greatly complicating the process, but we have not had sufficient experience with this further purification to say that it can be relied upon as to its uniform results. This will be reported upon later.

Before concluding I desire to call attention to a simple method of assaying, a general method, but applicable to gelsemium, by M. H. Webster (Amer. Jour. of Pharm., July, 1907, pp. 301-307). His process if applied to fluidextract of gelsemium would be in substance as follows:

To 10 Cc. of the fluidextract add 1.50 Gm. of tartaric acid; filter off

the precipitate, washing the precipitate with absolute alcohol. Add sufficient absolute alcohol to make 100 Cc. Shake well, then set aside for a few minutes; filter; transfer 50 Cc. of the filtrate to a shallow dish of 6 inch diameter, and evaporate carefully on a water-bath, rotating the contents of the basin occasionally, and especially toward the end of the evaporation, so that the resulting extract may cover a large portion of the basin; when dry, cool the extract; add 10 Cc. of half-normal sulphuric acid and rotate the liquid in the dish until the extract is dissolved or disintegrated; set aside for 2 minutes. Filter the liquid through a small, firmly packed pledget of cotton wool, previously washed with water, into a large separator. Rinse the evaporating dish with 2 successive 5 Cc. portions of water, stirring to disintegrate the insoluble substances. To the separator add 20 Cc. of a mixture of 16 Cc. of chloroform, and 4 Cc. of ether; add 4 Cc., or q. s. of 20 per cent. solution of KOH, and shake vigorously. Separate the lower layer into a second separator containing 15 Cc. of distilled water, and, after agitation etc., as before, transfer the lower layer to a third separator containing 15 Cc. of distilled water; agitate. Pass the lower separated layer through a chloroform-washed pledget of cotton wool into a fourth separator of about 150 Cc. capacity. Repeat the extraction till no more alkaloid is obtained, with two or more portions of the immiscible solvent, which finally collect, after washing as before, in separator number 4. To the bulked ethereal extracts add excess of $\frac{N}{50}$ or $\frac{N}{100}$ sulphuric acid and shake thoroughly. Reject lower layer; add cochineal T. S., and titrate back with $\frac{N}{50}$ NaOH solution. The latter process has the advantage, as claimed by the author, of eliminating traces of ammonia which seems to be ever present, and is apt, in gelsemium particularly, to give unusual trouble.

Employing the first process, which we know by experience to give uniform results, we have assayed in the laboratory several samples of fluid-extract of gelsemium sent to us for examination. These samples were from the laboratories of different manufacturers. Our results were as follows:

	Specific Gravity at 25-15° C.	Total Solids per 100 Cc.	Total Alkaloids (Grav.).
I	0.990	11.589 Gm.	0.178
II	0.857	6.888 Gm.	0.240
III	0.955	8.674 Gm.	0.370
IV	0.900	13.290 Gm.	0.529

It should be stated in this connection that the above figures do not give a satisfactory comparison, for the reason that in the alkaloidal residues there were different percentages of coloring matter, the largest amount of this being present in the fourth specimen. We are inclined to the opinion that a thoroughly honest and satisfactory comparison can be arrived at

only by further purification of the alkaloidal residue. The Webster process is very promising in this direction, and we hope to give it a thorough trial.

Mr. Chas. E. Caspari moved to accept and refer for publication.

Mr. Coblenz said that with reference to the variations in the melting-point of gelsemic acid as given by various investigators, there was not the slightest doubt in his mind that different substances were examined; or, more accurately expressed, all did not have gelsemic acid in its purest state. When we consider the fact that gelsemic acid is an exceedingly reactive substance, possessing the properties of a weak acid, resembling a phenol, and that when brought into contact with various reagents it readily breaks down into other products, we cannot wonder at the discordant results. The product he had handled was prepared by Prof. Lloyd, without the use of any precipitants or alkalies or reducing agents, all of which react readily with gelsemic acid. The combustion of this substance was exceedingly difficult, owing to the separation of the carbon in the form of graphite; no molecular weight determinations could be made either by the kryoscopic or ebullioscopic methods owing to reactions between the substance and the solvents employed.

Mr. Lloyd stated that the gelsemic acid referred to by Mr. Coblenz was part of a lot he had made for Prof. Flückiger, who was then working on the problem as to the relations between aesculin and gelsemic acid. He described his process of making this preparation, and said Prof. Flückiger had reported to him by letter that it differed from aesculin. He had waited for the publication of the paper on gelsemic acid and aesculin, but the Professor had unfortunately died, and the paper had never been published that he knew of.

Mr. Lloyd said he desired to call the attention of Mr. Sayre and others—for he was right in this matter—to the changes that might take place, in not only the drying of the plant, as for instance the difference between the dry and green plant, but also in the structural changes that might be made in the proximate principles by the chemicals applied. In this case the aim was to avoid all chemicals, and to get the gelsemic acid from the gelsemium in a form as near as possible to that in which it existed in the plant, or at least when taken out of the plant structure, by means of a normal, neutral solvent.

Anyone can obtain gelsemic acid very easily by this method, and until that method is employed he thought the work on that substance would be defective, in the presence of these substances so easily changed in the presence of chemicals and of each other.

The Chair next called on Mr. Eldred to read his paper on "Assay of Cantharides," and also his paper on "Estimation of Iron in Scale Salts." Mr. Eldred presented these subjects as follows:

THE ESTIMATION OF CANTHARIDIN IN CANTHARIDES AND PREPARATIONS.

FRANK R. ELDRED AND W. C. BARTHOLOMEW, INDIANAPOLIS, IND.

About a year ago some experiments were made in our laboratory for the purpose of devising a reliable method for assaying cantharides. Owing to the pressure of other work these experiments had to be discontinued.

Fairly satisfactory results had, however, been obtained by the following method. The drug was percolated with a mixture of chloroform and glacial acetic acid, the percolate evaporated in a porcelain dish and treated with milk of lime. The resulting calcium soap was extracted with successive portions of hot water, the aqueous solution filtered into a separatory funnel, acidulated with hydrochloric acid and extracted with chloroform. The chloroformic solution was evaporated in a tared beaker and the crystals washed with petroleum ether. Great care was necessary in extracting the calcium soap with hot water and the results were not sufficiently accurate.

In the meantime a paper appeared by Self and Greenish,* in which they review the various methods which have been proposed for assaying cantharides, and describe a new method which gives very good results.

The method is briefly as follows: Moisten 20 Gm. of cantharides with 3 Cc. of concentrated hydrochloric acid and extract in a Soxhlet's apparatus with 80 Cc. of benzene, using 25 Cc. of benzene for washing the Soxhlet's apparatus. Distil off the benzene on a water-bath and remove the last traces by a current of air. Shake the distilled benzene with three portions of 1 per cent. potassium hydroxide solution. Acidulate the mixed aqueous liquid with hydrochloric acid, make up to 105 Cc. with water, and add to the residue of fat and cantharidin in the flask. Boil the mixture for ten minutes under a reflux condenser. By means of a pipette transfer 100 Cc. of the aqueous layer to a separatory funnel and repeat the boiling with four more portions of water, of 50 Cc. each. Add 3 Cc. of concentrated hydrochloric acid to the aqueous solution and extract it with four portions of chloroform. Distil off the chloroform; wash the residue with three portions of 5 Cc., 5 Cc., and 2 Cc. of a mixture of equal parts of absolute alcohol and petroleum ether saturated with cantharidin, and then with petroleum ether. The purified cantharidin is dried at 60° to 65° C. until of constant weight.

As this method seemed rather complicated, and as we had found that cantharidin volatilizes when heated to 65° C., it was thought desirable to see if a simpler method could be devised which would at the same time give more accurate results.

Since a sufficient amount of cantharidin for weighing is obtained from 10 Gm. of cantharides, this amount was extracted by percolation with

* Pharm. Journ., 78-324, 1907.

chloroform containing a small amount of glacial acetic acid, as we had already found that the cantharidin could be completely extracted in this way.

Unsuccessful attempts were made to extract the cantharidin from the residue left on evaporating the percolate by means of solutions of barium, strontium and lithium hydroxides.

It was found that the cantharidin could be extracted from the oily residue by means of 25 per cent. acetic acid. This acid solution was then shaken out with chloroform. The chloroform dissolved acetic acid,* and it was necessary to keep the residue obtained on evaporation of the chloroform under reduced pressure until the acetic acid volatilized before purifying, as directed by Self and Greenish.* As this required too much time the method was abandoned.

The method finally determined upon was as follows: Place 10 Gm. of cantharides in No. 60 powder in a small percolator provided with a stop-cock,† add a mixture of 25 Cc. of chloroform and 2 Cc. of glacial acetic acid and allow to macerate for one hour. Then drain the percolator, pack the drug firmly and exhaust by slow percolation with chloroform, receiving the percolate in a Gordin's distilling flask.‡ Distil off most of the chloroform by means of a water-bath and blow air through the flask to remove the last traces. Add 10 Cc. of liquid petrolatum and 150 Cc. of hot water to the residue in the distilling flask. Heat nearly to the boiling point on a water-bath and agitate several times while keeping at this temperature. Draw off the aqueous solution through a small filter into a separatory funnel. Repeat this operation with three more portions of 75 Cc., 50 Cc. and 25 Cc. of water. Cool the mixed aqueous liquid, add a little hydrochloric acid and extract by shaking with four portions of chloroform. Evaporate the chloroformic solution in a tared flask or beaker on a water-bath. The solution must be removed from the water-bath while some chloroform remains, and the evaporation completed in a current of air as decrepitation occurs, when the cantharidin begins to crystallize. The cantharidin is then purified in the manner described by Self and Greenish || as follows: Wash the crystals with three portions of 2.5 Cc., 2.5 Cc. and 1 Cc. of a mixture of equal parts of absolute alcohol and petroleum ether saturated with cantharidin, pouring the washings through a small filter. Then wash the crystals and filter with petroleum ether until the filtrate leaves no appreciable residue on evaporation. Wash the filter with a little chloroform, receiving the filtrate in the vessel containing the greater portion of

* *Loc. cit.*

† A convenient form was described by one of us in the Jour. of the Amer. Chem. Soc., 28-187, 1906.

‡ Proc. Am. Pharm. Ass'n, 54-378, 1906.

|| *Loc. cit.*

the cantharidin. Evaporate the chloroform in a current of air and dry at ordinary room temperature in a vacuum desiccator until of constant weight.

Paraffin or coal oil may be substituted for liquid petrolatum with equally good results. The method may be carried out without the special forms of apparatus suggested but their use greatly facilitates the operation and eliminates the danger of loss in transferring. Attempts were made, by washing the aqueous solution and cantharidin with various solvents, to obtain the cantharidin in a pure enough state to render the final washing of the crystals unnecessary, but without success.

A sample of Spanish cantharides was then assayed by this method and by the method proposed by Self and Greenish. Assays were also made by Self and Greenish's method, modified by drying the cantharidin in a vacuum desiccator instead of at 60°–65° C.; and, later by substituting chloroform extraction in the presence of acetic acid for benzene extraction (thus eliminating the step of recovering the cantharidin from the benzene distillate), and drying in a vacuum desiccator. The results are shown in the following table:

SPANISH CANTHARIDES, SAMPLE NO. I.

Percentage of cantharidin found.

Self & Greenish. Cantharidin dried at 65° C. for 25 minutes.	Self & Greenish. Cantharidin dried over sulphuric acid under a pressure of 50 Mm. to 60 Mm.	Self & Greenish. Drug extracted with chloroform and cantharidin dried in vacuum desiccator.	Present method. Cantharidin dried over sulphuric acid under a pressure of 50 to 60 Mm.
0.668	0.686	0.691	0.697
0.662	0.683	0.693	0.697
0.661	0.677	—	0.698
0.659	0.671	—	0.698
—	0.674	—	0.697

Other samples of cantharides were assayed with the following results:

	Spanish No. 2.	Spanish No. 3.	Chinese No. 1.	Chinese No. 2.
Present method.....	0.683	{ 0.577 0.575	1.246	1.362
Self & Greenish, modified....				1.359

It will be seen from the tables that the results obtained by Self and Greenish's method are somewhat low, and that the loss of cantharidin is due partly to the method of drying and partly to the method of extracting the drug.

The volatility of cantharidin at 40° and 65° C. is shown below :

Amount of pure cantharidin weighed.	1 day over sul- phuric acid. Atmospheric pressure.	5 hours sulphuric Pressure 60 Mm.	over 5 acid. sulphuric 50 to Pressure to 60 Mm.	5 days over sulphuric acid. 50 to Pressure to 60 Mm.	2 hours at 40° C.	25 min. at 65° C.	1 hour at 65° C.
0.513	0.5129				0.503		
0.536	0.5359				0.525		
.0495					.0487		.0462
.0731		.0731		.0731		.0714	
.0737		.0737		.0737		.0719	

These results show that it is impossible to dry cantharidin to constant weight at a temperature of 65° or even 40° C.

Self and Greenish* state that cantharidin volatilizes with benzene vapor and, to a less extent, with chloroform vapor, and give the amounts of cantharidin found in benzene and chloroform distilled from solutions of cantharidin. They do not, however, state what amounts of the solution were distilled. In order to determine to what extent this would affect the results obtained in assaying cantharides, 50 Cc. of a 0.2 per cent. solution of cantharidin in chloroform were distilled just to dryness on a water bath, the distillate when allowed to evaporate spontaneously left a residue of .0002 Gm. This experiment was repeated with the same result. Benzene was then substituted for chloroform in two instances with the same result. On evaporating a solution of .1583 Gm. of cantharidin in 200 Cc. of chloroform, and drying the residue, .1580 Gm. remained.

From these experiments it is evident that the recovery of cantharidin from benzene or chloroform distillates is unnecessary. This was further shown in assaying a sample of Chinese cantharides by Self and Greenish's method, the benzene distillate on being allowed to evaporate spontaneously left no weighable residue. The total error due to volatilization of cantharidin with chloroform and benzene vapor should not exceed .0004 Gm. when operating on a 10 Gm. sample of cantharides. This was further shown by carrying pure cantharidin through all of the steps of Self and Greenish's method (except the final drying at 60° to 65° C.), and of the present method.

* *Loc. cit.*

	Amount taken.	Amount found.
Present method.....	.0734 .0635	.0730 .0633
Self and Greenish.....	.0738 .0698	.0732 .0691

* In assaying cantharides cerate, extract 25 Gm. with a mixture of 150 Cc. of chloroform and 2 Cc. of glacial acetic acid, in a Soxhlet's apparatus. If the cerate is placed loosely in the tube no trouble will be experienced in the extraction. Distil off the chloroform and proceed as in assaying the crude drug omitting the liquid petrolatum. A cerate made by the U. S. P. method from cantharides containing 0.683 per cent. of cantharidin assayed by this method 0.213 per cent. and 0.214 per cent.

The tincture can be assayed by adding 2 Cc. of glacial acetic acid to 100 Cc. of the tincture, distilling off the alcohol and completing the assay in the manner described for crude drug. An official tincture assayed by this method 0.040 per cent. and 0.0405 per cent. The alcohol can be evaporated from a tincture without appreciable loss of cantharidin.

This was shown by extracting 10 Gm. of cantharides, containing .0697 Gm. of cantharidin, as thoroughly as possible with alcohol. The percolate when assayed by the above method was found to contain .0637 Gm. of cantharidin, and the drug on extraction with chloroform and acetic acid yielded .0057 Gm., making a total of .0694 Gm. recovered from the drug, thus showing the reliability of this method when applied to an alcoholic percolate.

THE ESTIMATION OF IRON IN SCALE SALTS.

BY FRANK R. ELDRED AND C. M. PENCE, INDIANAPOLIS, IND.

The method recognized by the U. S. Pharmacopœia for the estimation of iron in scale salts is the well known method depending upon the reduction of ferric iron by hydriodic acid produced by the interaction of potassium iodide and hydrochloric acid. The method as originally given in the Pharmacopœia, 8th revision, for soluble ferric pyrophosphate was faulty, in that the amount of hydrochloric acid was insufficient to retain the iron in solution, and the results obtained were, therefore, much too low. The amount of hydrochloric acid was increased in the list of corrections issued by the Revision Committee May 1, 1907.

In endeavoring to find what conditions would give the best results with soluble ferric pyrophosphate it was noted that the proportions of hydrochloric acid and potassium iodide in solution could be varied within wide limits provided sufficient hydrochloric acid was present to retain the iron in solution. However, the amount of iodine liberated increased with the length of time during which the reaction was allowed to proceed. When the reaction took place in an atmosphere of carbon dioxide there was no further liberation of iodine after the first few minutes. This was found to

be true of all of the official scale salts. The results obtained with ferric citrate, containing 19.64 per cent. of iron, estimated gravimetrically, are shown in the following table :

Time reaction was allowed to proceed.....	$\frac{1}{2}$ hour	4 hours	14 hours	18 hours	24 hours	42 hours	68 hours
Percentage of iron found when bottles were filled with air	18.2	18.3	—	18.9	19.3	—	19.9
Percentage of iron found when bottles were filled with carbon dioxide	—	—	18.3	—	—	18.3	—

In making the above determinations a blank experiment was carried out in each case and the proper correction made. All of the figures in the table represent the average results obtained in several determinations.

From the results obtained in an atmosphere of carbon dioxide it appears that the further oxidation of hydriodic acid which occurs upon prolonged standing in the air is not due to the direct reduction of ferric iron.

The iron was estimated in the official scale salts by the pharmacopœial method and also gravimetrically, the average results being shown below. The individual results agreed very closely among themselves except in case of the tartrates, where concordant results were not obtained by the iodometric method.

	Gravimetric results.	Iodometric results.
Ferric citrate.....	19.64	18.61
Iron and ammonium citrate	20.36	19.15
Iron and ammonium tartrate	21.10	15.97
Iron and potassium tartrate.	18.95	13.71
Soluble ferric phosphate.	13.53	12.52
Soluble ferric pyrophosphate	12.10	9.94

It will be seen that the results obtained by the iodometric method are all lower than the gravimetric results. It was thought that this might be due to the presence of ferrous iron. A solution of each salt was made, acidulated with hydrochloric acid and tested with potassium ferricyanide. The tartrates gave a green color, but the other salts seemed to be free from ferrous iron. This seemed to account for the much greater difference between gravimetric and iodometric results in case of the tartrates.

It was decided to prepare a specimen of iron and ammonium tartrate in the laboratory, starting with a solution of ferric sulphate free from ferrous iron. When the ferric hydroxide was dissolved in the ammonium bitartrate solution, no color was produced with potassium ferricyanide; but when the solution was evaporated, ferrous iron could be detected long before the solution was sufficiently concentrated to spread on the glass plates.

A solution of this iron and ammonium tartrate after heating on a water bath for several days, gave a decided blue precipitate with potassium ferricyanide. A solution of iron and ammonium citrate similarly treated gave a green color. From this it was inferred that the presence of ferrous iron was the cause of the low results obtained by the iodometric method.

It was found that considerable amounts of ferrous iron, in the presence of citric and tartaric acids failed to give a blue or green color with potassium ferricyanide.

As it was already evident that the tartrates could not be manufactured without some reduction of iron, it was decided to investigate the reducing action of citric acid.

For this purpose the method of titrating ferric salts with a solution of titanous chloride as introduced by Knecht * seemed most convenient. A standard ferric chloride solution was prepared and used in standardizing the titanous chloride solution. It was found that methylene blue served as a convenient indicator in this titration but considerable difference was noted in the sharpness of the end point with different samples of methylene blue.

The method of titrating ferric salts with titanous chloride is very satisfactory and as the titanium solution holds its titer well, when preserved in the manner directed by Knecht, it deserves a more extended use in volumetric analysis.

In order to test the action of citric acid and citrates on ferric salts, portions of the standard ferric chloride solution were heated with citric acid and sodium citrate.

To reduce 20 Cc. of the standard ferric chloride solution required 34.1 Cc. of the titanous chloride solution, but after evaporating to a syrupy consistency with 1 Gm. of citric acid, only 32.1 Cc. were required. A duplicate experiment required 32.05 Cc. Sodium citrate in neutral solution also caused reduction although in a slightly smaller degree.

All these facts point to the conclusion that the low results obtained by the iodometric method are due to the presence of ferrous iron. Power, † who studied this method of estimating iron in scale salts, also obtained results considerably lower than those which he obtained by direct ignition of the salts, but attributed this to the greater accuracy of the iodometric method.

In all of the official scale salts the ferric iron was estimated by titration with titanous chloride, the results agreeing fairly well with the iodometric results, except in case of the tartrates. Titration with stannous chloride gave similar results.

It was now sought by various means to oxidize all of the iron to the

* Ber. d. Deutsch Chem. Ges. 36, 1549, 1903. *Ibid.* 38, 3318, 1905.

† Pharm. Rund. 9, 205, 1891.

ferric condition. It was found that in order to accomplish this the citric or tartaric acid present must be completely oxidized. The only practical method of oxidation found was by means of concentrated sulphuric acid. The scale salt (0.5 Gm.) was placed in a 500-Cc. Kjeldahl flask, 20 Cc. of concentrated sulphuric acid and 10 Gm. of potassium sulphate were added, and the flask heated until only a pale yellow color remained. The contents of the flask were then dissolved by heating with about 200 Cc. of water, and the solution cooled and titrated.

	Direct titration with titanous chloride.	Titration with titanous chloride after oxidizing.
Ferric citrate.....	18.77	19.31
Iron and ammonium citrate.....	19.6	19.76
Iron and ammonium tartrate.....	18.93	20.48
Iron and potassium tartrate.....	16.01	18.67
Soluble ferric phosphate	11.81	12.8
Soluble ferric pyrophosphate	10.8	11.67

All methods which depend upon the reduction of ferric iron give low results when applied to scale salts; moreover, if heat is used in dissolving the salt a further reduction of iron will take place, especially with the tartrates, where concordant results cannot be obtained unless the conditions under which the salt is dissolved are always the same.

In order to determine the total iron in scale salts it is necessary to employ a gravimetric method, or to completely oxidize the organic acid and ferrous iron before titration.

Mr. Sayre moved that the paper be received.

Mr. Kebler said he thought the papers of Mr. Sayre and Mr. Eldred were along the right lines. What is wanted is more constructive work and less destructive; let us build up and not tear down continually. Some chemists make the mistake of thinking they can analyze anything, and some claim they can estimate cantharides in all sorts of mixtures. He had gone into this subject, however, and knew it could not be done. There are some ways in which Spanish cantharides can be estimated sometimes, but it cannot be done chemically.

As to the drying of residues, as referred to in Mr. Sayre's paper, and also in the paper on cantharides, Mr. Kebler said he thought that was an important point. As soon as possible the chemists in the United States ought to adopt uniform methods for determining non-volatile matter. He said his department was doing a great deal of work along these lines of determining what methods could be used to advantage in the assay of drug products. They had a number of men at work on that proposition, but because of the many changes contemplated in the Pharmacopœia, and because of the fact that they could not get the chemists, they had not done

as much work as they had desired to do. He hoped this fall to be able to publish their results, and in that way to form a basis for work along this line.

The Chair asked Mr. Kebler whether drying agents were used, such as sulphuric acid, and Mr. Kebler replied that they had not yet employed sulphuric acid, but only heat.

Mr. Coblenz said this work of Messrs. Eldred and Pence was covered during the pharmacopoeial revision, the results of the committee being in accordance with theirs. The committee had found very small quantities of ferrous salts in the scale preparations, even when quite old. The slightly lower results of the iodometric method caused by this did not deter them, however, from adopting the method in preference to the gravimetric, which will always give more or less high results influenced, in addition, through imperfect washing of the ferric hydroxide.

The Chair then called on Mr. Koch, of Chicago, to present short abstracts of his papers on "Organotherapeutic Products and U. S. P. Methods for Assaying Pepsin." Mr. Koch presented the papers in abstract, the following being their full text :

ORGANOTHERAPEUTIC PRODUCTS, WITH SPECIAL REFERENCE TO THE STANDARDIZATION OF THYROID PREPARATIONS.

BY F. C. KOCH, CHICAGO, ILL.

It is hardly necessary to state that organotherapy is as old as any form of medical treatment. Although many of the methods employed during the remote and dark ages were based on superstition, still at the time of Hippocrates we find rennet used for stomach disorders, liver for hepatic troubles, and brain for tremors. Not however until the eighteenth century was any progress to speak of made. Thus in 1776 Haller * first suggested in regard to the thyroid glands, and Schmitt, in 1785, in regard to the suprarenals, what in 1891, Brown-Sequard and D'Arsonval † published as their "internal secretion" theory. Brown-Sequard extended this theory not only to the ductless glands, but to every tissue of the body, the theory being that all tissues yield as a result of their normal metabolism one or more definite substances necessary to the normal functioning of the organism.

Taking organotherapy then in this broadest sense we can conveniently arrange the various preparations now employed into four main classes :

* Todd's Cyclop. of Anat. & Physiol.

† Comptes Rendus Soc. Biol., 1891.

1. Ductless gland preparations :

Thyroid,	Corpus luteum,
Suprarenal,	Carotid,
Pituitary,	Coccygeal bodies,
Thymus,	Parathyroids.
Spleen,	
Lymphatic glands.	

2. Digestive ferments :

Pepsin,	
Rennet,	
Pancreatin	{ Amylopsin or Diastase,
	{ Trypsin.

3. Other specific glandular products, obtained from organs which in addition to the known functions also seem to yield an "internal secretion."

Secretin,	Kidney,
Parotid,	Ovary,
Prostate,	Mammary,
Testicle,	Pancreas.

4. Miscellaneous products :

Hemoglobin,	Nuclein,
Lecithin,	Bile,
Glycogen,	Red bone marrow.

Very little is known as to the physiological action and true chemical nature of the greater number of these preparations, and not until the last ten years was rapid progress made in these directions with regard to only a few of these important products. Thus, in the first class we have thyroids and suprarenals as the most thoroughly studied. In regard to the second class all we can say is that we know considerable as to the actions of the ferments, but that none of them have been separated in pure form, and that we know practically nothing as to their chemical structure. The best known of class three and the one from which a definite principle has been separated is the testicle. The pancreas and secretin have been studied extensively in connection with diabetes during the last five years, but as yet little of immediate therapeutic value has been determined. Most of the members of the fourth class have been studied quite extensively in a chemical way, and red bone marrow has been used very successfully in therapeutics.

Of all these animal therapeutic products only five have been recognized in the U. S. Pharmacopœia. These are pepsin, pancreatin, desiccated suprarenals, desiccated thyroids and bile. Quantitative standards for pepsin and pancreatin have been fixed and changed from time to time,

but the U. S. Pharmacopœia descriptions and specifications as regard desiccated thyroids and suprarenals are, strictly speaking, only qualitative.

Thus the test given for the thyroids is simply a qualitative one for organically combined iodine. Does the iodine content measure the physiological activity of the product and are we at present in a position to definitely distinguish this iodine compound from others? A short statement as to the facts determined since the discovery of iodine in thyroid tissue by Baumann in 1905*† I believe will answer these questions. Baumann*† at that time also separated iodothyrim and considered it the active principle. Notkin‡§|| at about the same time prepared protein products which he claimed could be obtained free from iodine by dissolving in water and reprecipitating five or six times. Oswald¶ in repeating the work in 1898, could not verify this. He however separated a globulin which he called thyreoglobulin and which he found contains all the iodine in the gland. He also proved that the protein products separated by Bubnow**, Gourlay††, Notkin‡§|| and Hutchison‡‡§§ were mixtures of this thyreoglobulin with an iodine-free nucleoproteid. The thyreoglobulin as separated by Oswald's method possesses the same solubilities and composition as the globulins in general, with the one exception that it contains iodine. The group containing the iodine may be split off as Baumann's iodothyrim. It is very stable in that the iodine is not converted into the inorganic state by boiling with 10 per cent. sulphuric acid nor by peptic or tryptic digestion. I have found that even boiling or evaporating to dryness with 40 per cent. NaOH does not give the iodine as sodium iodide. Neither does heating in an autoclave with 40 per cent. NaOH solution for three hours under a pressure of 25 pounds per square inch seem to split off any of the iodine in the inorganic form.

The amount of iodine in the thyreoglobulin as now separated varies from 0 to 0.93 per cent. and probably more, depending on the age, condition and place of abode of the organism. Thus Oswald ||| found 0.07 to 0.34 per cent. in human thyreoglobulin, none to 0.64 per cent. in that from calves, 0.73 to 0.93 per cent. in that from oxen, 0.46 per cent. in hogs'

* Zeits. Physiol. Chem., 1895.

† Zeits. Physiol. Chem., 1896.

‡ Wein. Med. Woch., 1895, Nr. 19, 20.

§ Apoth. Zeitung, 1896, Nr. 13.

|| Virchow's Arch., Vol. 144, 1896.

¶ Zeits. Physiol. Chem., Vol. 27, p. 14.

** Zeits. Physiol. Chem. Vol. 8, 1883, p. 1.

†† Jour. of Physiol., Vol. 16, p. 23.

‡‡ Jour. of Physiol., Vol. 20, p. 474.

§§ Brit. Med. Jour., Jan. 1897.

||| Zeits. Physiol. Chem., Vol. 32, p. 123.

and 0.26 to 0.53 per cent. in sheeps' thyreoglobulin. By careful histological and chemical examinations he found that only those thyroid glands which showed presence of colloid contained iodine-bearing thyreoglobulin, and that the total amount of iodine in both the gland as well as the per cent. in the separated thyreoglobulin was greatest in the normal glands. He also showed that the iodothyryns prepared from these different thyreoglobulins also vary in the per cent. of iodine. Thus in iodothyryn from normal hog thyreoglobulin he found 7.11 per cent. iodine, and that from colloidal goitrous hog thyreoglobulin contained only 0.25 to 1.03 per cent. From colloid-free thyroids he prepared an iodine-free thyreoglobulin, and from this an iodine-free iodothyryn.

Cyon and Oswald*† together and independently and Roos‡ alone, in studying the effect of the various thyroid preparations on blood pressure, heart action and on the nitrogen metabolism, concluded that the activity depends on the iodine content; that the iodine-free preparations are inactive, and that the most active are those highest in iodine. I believe we can safely conclude from this that the activity of the thyroid preparations as regards their influence on metabolism can be measured by the iodine content. Marine§ says: "From Oswald's work we have reason to believe that the body economizes iodine not unlike it does iron, and indeed, carrying the analogy farther, there is reason to suspect that iodine is related to endemic goitre not unlike iron is to chlorosis." Unfortunately, however, we have at present, to my knowledge, no chemical means of distinguishing the natural iodothyreoglobulin from other natural and artificial iodoproteins. Where possible adulteration is out of the question and it is simply a matter of comparison, the per cent. of iodine as determined by the Oswald-Fresenius method is no doubt entirely reliable. But what per cent. of iodine can be adopted as a standard for desiccated thyroids? There is considerable variation in the iodine content of the glands, just as there is considerable difference in the histological appearance. Glands which are abnormal in both respects in one district may be normal in another, and *vice versa* (Marine).|| So also much, no doubt, depends on the age of the animal, and possibly also on the time of the year when collected. I have recently had occasion to determine the per cent. of iodine in unadulterated desiccated sheep thyroids prepared at different seasons during the last two and one-half years, and found that the desiccations without exception test as much as three times higher during the winter months than during June and July, and that the per cent. gradually diminished toward the summer

* Pflüger's Arch., Vol. 83, p. 199.

† Beitr. Chem. Physiol. u. Path., Vol. 2, p. 545.

‡ Zeits. Physiol. Chem., Vol. 25, p. 242.

§ Jour. Infect. Diseases, Vol. 4, June 15, 1907.

|| Cleveland Med. Jour., Feb., 1907, p. 45.

months and then again gradually increased toward the winter. Everything considered, we see that it will require considerable careful work to establish a fair and reliable iodine content as a standard.

In preparing a physiological standard, we, of course, have the same variations to take into consideration. Thus far all physiological methods for testing thyroids, with the exception of Hunt's* † recent method of rendering mice less susceptible to acetonitrile poisoning by feeding thyroid glands, have been very crude. As a qualitative test Hunt's method is by far more delicate than any chemical means we know of, but so far it has not been perfected as a quantitative method. Thus, Hunt finds that the susceptibility of mice depends largely upon their age, weight and the nature of their food, also that 0.3 Gm. U. S. P. desiccated thyroids fed for 12 days did not seem to have a proportionately different effect from feeding 0.1 Gm. for 10 or 11 days, or 0.05 Gm. for 14 days. Let us hope that Hunt's very delicate method can be devised to be of value in a quantitative way.

THE UNITED STATES PHARMACOPŒIA METHODS FOR ASSAYING PEPSIN AND PANCREATIN.

BY F. C. KOCH, CHICAGO, ILL.

Although the United States Pharmacopœia methods for testing pancreatin and pepsin are far better than those given by other pharmacopœias, still I believe that several changes could be advantageously introduced. In determining the activity of such substances, the methods must necessarily be empirical and consequently the directions for assaying these products should be given in minutest detail and the standard adopted should be such that the final reading be as free as possible from errors introduced by personal equations. It is in regard to such details that it seems to me the United States Pharmacopœia directions are deficient.

In the assay of pepsin the following important details may be noted: The coagulated egg white should be passed through the sieve as soon after boiling as it can be conveniently handled, because long cooling renders the albumen tough, and consequently difficult to press through the sieve. So also the disintegration with acid water must be done without delay, as prolonged exposure of the egg white to the air, before disintegrating with acid water, renders it more difficult to digest and disintegrate. To obtain uniform results the disintegration must be thorough. This cannot be done thoroughly if one adds 20 cubic centimeters of acid water at once and then taps with cork or rubber tipped glass rod as the Pharmacopœia directs. However, by adding 2 cubic centimeters first and tapping thoroughly until uniformly moistened, then again adding 2 cubic centimeters

* Jour. of Biol. Chem., Vol. 1, Oct., 1905, p. 33.

† Jour. A. M. A., July 26, 1907, p. 240.

and tapping, and continuing thus with gradually increasing amounts of added acid water, we can readily separate the particles of egg albumen from each other. Again, immediately after adding the pepsin solution the mixture should be rotated in order to mix well, as it has been shown by P. Carnot and Chassevant,* as well as by Dauwe,† that egg albumen, among other substances, absorbs pepsin from solution. In the assay of pepsin by this method the pepsin must be uniformly distributed throughout the mixture so that the absorption by the egg white will proceed uniformly, and consequently the digestion also. In regard to shaking, I must say that instead of corking the digestion bottle, and agitating by inverting once, it is much more satisfactory to have the bottle uncorked and then agitate by rotating three times. By placing the cool corked bottle into the water-bath kept at 52° C., one finds on agitating by inverting that the cork comes out sooner or later with resulting loss of albumen and solution. Then, too, in agitating by rotation less of the not yet dissolved albumen remains adhering to the sides of the bottle. In the final reading of the undissolved material the Pharmacopœia directs to employ a narrow graduated cylinder, and that the deposit of undissolved material should not measure more than one cubic centimeter. Much depends on the kind of cylinder employed, whether it is one-half or one inch in diameter, and also whether the bottom thereof is a plane, convex, or concave surface. In determining the volume of this deposit we are reading off a layer, the surface of which corresponds more or less to the surface of the bottom of the cylinder. This is especially true in reading so small an amount as 1 Cc. in a 100-Cc. cylinder. The vessel employed for this final reading should be one to better answer the purpose, or we should change the standard so that the residue left be three to five cubic centimeters.

In assaying pancreatin we have both the milk peptonizing and starch converting powers to determine. In determining the peptonizing power the final test is to dilute a part of the digested milk with three volumes of water and then on mixing "with some nitric acid no coagulation should occur." In applying this test it depends entirely on how much and what strength of nitric acid is added. Thus, when ten cubic centimeters of the digested milk are diluted with 30 cubic centimeters of water and two cubic centimeters of 10 per cent. nitric acid are added no coagulation occurs even if only one-fifth the amount of pancreatin called for is used in the digestion. If, however, 3 cubic centimeters of the acid are added instead, no coagulation occurs when the required amount of pancreatin is used, but when one-half this amount of pancreatin is used we do obtain a coagulation. Again, when four cubic centimeters of the 10 per cent. nitric acid are added to 10 cubic centimeters of the digested milk with 30

* C. R. Soc. Biol., Vol. 53, p. 1172.

† Beitr. Chem. Physiol. u. Path., Vol. 6, p. 426.

cubic centimeters of water, coagulation occurs even if twice the amount of pancreatin called for by the Pharmacopœia is taken. Thus we see that each manufacturer is forced to adopt his own standard. If the test were given with the proper details as to definite amounts and strengths of acid added to a certain volume of the diluted milk we would have more uniformity and something more definite to go by. As the test is now given, anyone can at will make a pancreatin, whether weak or strong, answer or not answer the test, simply by adding small or large amounts of nitric acid.

In the diastasic assay of pancreatin it should be stated what kind of starch is to be used. Even different samples of the same kind of starch give different results in this assay. I have found that in using two samples of pure potato starch (as shown by the microscope and by analysis) the one required twice as much pancreatic diastase to convert it as the other in the same length of time. In preparing the starch paste it is much more convenient and reliable to use a beaker rather than a flask. By taking the dry starch in a beaker with 10 cubic centimeters of cold water, then while mixing adding 190 cubic centimeters boiling hot water and while stirring, boiling over a low flame for two minutes we readily obtain the translucent paste without burning part of the starch or breaking the vessel. The paste thus obtained can be mixed much more readily with the pancreatin solution. The other important details in testing for diastasic strength are :

1. The starch paste should be cooled to $40\frac{1}{2}^{\circ}\text{C}$. at once and the pancreatin solution added before the tough skin forms on the surface of the starch paste.

2. The pancreatin to be added should not be dissolved in the 10 cubic centimeters at $40\frac{1}{2}^{\circ}\text{C}$., longer than 5 minutes before adding to the starch paste.

3. The directions should state specifically that 4 minims, (not 4 drops) of the digestion mixture is to be added to the 60 cubic centimeters of dilute iodine solution. Much depends on the size of the drops taken.

4. In the final reading it would be much more accurate to allow not even a pink coloration when the four minims of the digestion mixture are added to the dilute iodine solution. The directions as now given allow a wine-red color, but very often the change in color from blue to pink is so gradual that the personal equation may introduce many variations in reaching the end point.

Mr. Francis opened the discussion of these papers of Mr. Koch by saying that he was very much gratified that the gentleman had read this (the latter) paper before the Section. He had taken occasion once or twice before to express his opinion of the official process for the testing of pancreatin, and he had even gone so far as to say in print that any one could "jockey" the official pancreatin test so as to obtain practically any results

desired. He was glad to see that these statements were confirmed in substance by the paper just read.

Mr. Francis stated further, in confirmation of the author's remarks, that the results obtained would depend almost altogether upon the amount of nitric acid used, and particularly upon the strength of the nitric acid employed, so that a very poor pancreatin could be made to answer the test and a powerful one could be made to show up very poorly. He would recommend that if possible this portion of the test, involving the use of milk, be stricken from the Pharmacopœia, not only on account of its unreliability for the reasons above noted, but because the test is unreliable by virtue of the material employed as a test agent. What is meant by "milk?" The tests are usually carried out in cities, and if there is anything uncertain it is the character of the milk sold in cities and in the large towns. It cannot be expected that manufacturing pharmacists will raise and maintain herds of cows for the purpose of supplying milk for pancreatin testing. If the milk happens to be inferior you get one result; if it contains formaldehyde you get another; if it is sour you get still another, and all are misleading.

As regards the test on starch we certainly lack a reliable method of valuing diastasic agents. The best we have at the present time is perhaps that published in the U. S. P., 8th Rev., under the pancreatin assay, but it is well known to those who have intimately studied this question that the diastasic agents do not all act alike; that the process which is applicable to one may do grave injustice to another.

The point made as to the selection of starch is also a good one. Starches do not all act alike. Potato starch differs from corn starch in its response to diastasic digestion, due probably to the fact that corn starch usually contains a considerable portion of undeveloped grains or starch cells, and these break up very imperfectly in the preparation of starch jelly by boiling with water. The result is that there is imperfect penetration and consequently imperfect digestion of the starch in the partly ruptured cells. Potato starch is in every way very much superior for the conduct of such a test, as the grains are usually full grown and it yields a homogeneous starch paste which seems to digest more easily, naturally and regularly. Even here precautions should be taken to insure that the starch is absolutely neutral. A great deal of the starch on the market is decidedly alkaline or acid in reaction. We know that pancreatin acts best in an alkaline medium, and some diastases in an acid medium. We have taken the matter up with certain manufacturers, and they have repudiated the statement that potato starch is ever acid, but we know as the result of numerous tests that sometimes it is. Whether this condition is produced from over-exposure and fermentation during warm weather in the process of extracting the starch we do not know, but that is a minor matter. We think that sometimes alkali may be used to offset the acid which results from

fermentative processes, and this is afterwards neutralized by the addition of alkali, which may result in the starch having a decidedly alkaline reaction. The important point is that such tests should be so worded as to specifically demand a certain kind of starch, and that this should be absolutely neutral.

The Chairman suggested, regarding the selection of starch, that it should be remembered that the starch to be used is the official starch of the Pharmacopœia—*amylum*; but at the same time this specification permits quite a wide range. The tests are not very strict in prescribing the starch to be used.

Mr. Kebler did not think that there were many problems more difficult of solution than some of those before the Section. The assay methods employed for determining the activity of pancreatin have long been bones of contention. The only satisfactory method for the future, in his opinion, appears to be one based upon the actual amount of starch converted into sugar. As long as we are compelled to depend upon color reactions there will always be trouble. We have been at work in Washington on this problem, but no two men in the laboratory have succeeded in securing concordant results; in fact they are frequently widely divergent. They are still working along this line, and hope that with the co-operation of other workers to find some method that will be satisfactory, not only to manufacturers, but also to those employing these products for medicinal purposes.

As stated by the author of the papers, the amount of iodine present in thyroid products appears to be a very important factor. This question is also brought up in connection with the codliver-oil investigations, and they now have the matter under consideration. The various thyroid products are at present very largely employed as the basis of the so-called obesity foods. Recently while in Detroit, Mr. Kebler said he had gone into a place where one of these products was being put up for distribution, and it was shown that the article was placed upon the market in a manner similar to our old friend "Kargon Compound." A given quantity of these preparations is sent to the trade with instructions that a given quantity of same be mixed with certain definite proportions of other ingredients. What is the result? These thyroids are insoluble, and inasmuch as the preparation is in liquid form the thyroid material settles to the bottom, and unless great care is exercised the entire quantity of thyroids may be taken in the last dose. Such a dose might produce very undesirable symptoms.

There was no further discussion of the papers last read, and the Chairman announced an adjournment to 3 o'clock p. m., sharp.

SECOND SESSION—THURSDAY AFTERNOON, SEPTEMBER 5, 1907.

Acting Chairman Vanderkleed called the Section to order at 3 : 15 p. m., and called for the reading of the minutes of the morning session as the first order of business. Secretary Coblentz read the minutes, which were approved as read, *except* that Mr. Vanderkleed stated he had withdrawn his name from nomination for Secretary, and the Secretary had reported him as in nomination for that office.

The Chair then called for further nominations for Chairman and Secretary of the Section. Mr. Cliffe again placed Mr. Vanderkleed in nomination for Secretary, and on motion of Mr. Eberle, nominations for all offices were closed. Mr. Hallberg then took the Chair for the moment, and said it had been moved and seconded that he be ordered to cast the ballot of the Section for the gentlemen in nomination for the various offices, and this motion was put to a vote and carried. Thereupon, Mr. Hallberg declared that he had cast the ballot of the Section for Mr. Virgil Coblentz, of New York, for Chairman, and Mr. Chas. E. Vanderkleed, of Philadelphia, for Secretary, and Mr. Jos. Feil, of Cleveland, for Associate, and that these gentlemen were duly elected officers of the Section for the ensuing year.

Acting Chairman Vanderkleed then called on Mr. A. R. L. Dohme to present a paper prepared by himself and Mr. Engelhardt upon the subject of the "U. S. P., Eighth Revision," which he said was one of the papers left over from their morning session. Mr. Dohme presented the paper in abstract, the full text being as follows :

THE U. S. P. 8TH REVISION AND ITS RELATION TO SOME DRUGS AND CHEMICALS.

BY A. R. L. DOHME AND H. ENGLEHARDT, BALTIMORE, MD.

As the requirements of the U. S. P. Revision are very rigid, even more than those of most other pharmacopœias, it was natural that we had little trouble in securing products, drugs as well as chemicals, which did not comply with the tests for purity and strength contained in the U. S. P. As the Pharmacopœia was not when it was written intended or drawn up to be a legal standard as it subsequently became, the requirements of purity, etc., in several instances, were reduced by the issuance of the additions and corrections of the U. S. P. 8th Revision, which went into effect subsequent to its publication. These reductions were quite necessary, because either drugs of the official standard were difficult to obtain, or because the required purity of the chemicals was so high, that repeated purification of the products was necessary, involving unnecessary costs for the manufacturer and the consumer. In a few instances, however, the requirements are in our opinion rather lenient. We give below a report of our experiences with some articles of the U. S. P., which gave us trouble and did not measure up to official requirements and also some sug-

gestions as to modifications of tests that might prove of interest to the Revision Committee.

Acetphenetidin: One lot was adulterated considerably with acetanilide.

Aether: It is to be regretted that the U. S. P. did not take up an "*Aether pro narcosi*" with more stringent requirements for its purity.

The same must be said about chloroform a "*Chloroform pro narcosi*" should be adopted by the U. S. P., as has been done in many of the newer pharmacopœias. The tests for chloroform as given in the U. S. P. do not exclude phosgen (carbon oxychloride), the substance which as is generally admitted, causes the undesirable effects of chloroform and has even produced death. The bilirubin test for phosgen should be introduced.

The tests for ether as well as chloroform are rigid enough for a good commercial product, but there is sufficient doubt, whether or not they allow substances to escape, which render the ether and chloroform improper or even dangerous as anesthetics.

Aloin: The requirements of the solubilities in water, alcohol and acetone have been reduced by the corrections. In the given proportions, however, the aloin is not entirely soluble. The reduction of the solubilities was necessitated by the fact that the commercial product is not at all a uniform substance, but consists of at least two different bodies. An investigation of these substances is now under way and we hope to report on it in due time.

Amyl nitrite and Ethyl nitrite: The Dutch Pharmacopœia applies for the estimation of these preparations, Dietze's method, which gives very good results, is short in manipulation and does away with the use of the nitrometer.

Asafetida: A sample was assayed, yielding 60 per cent. of ash, and 8 per cent. (!) of alcohol-soluble matter. How did it get into the country?

Belladonna Leaves: The standard for this drug has been reduced to 0.3 per cent., which was not at all necessary, as leaves with 0.45 per cent. can easily be obtained.

Belladonna Root: It is said that on account of the scarcity of the root, this article is adulterated frequently with the root of *phytolacca decandra*, but as yet we have not found any adulteration with poke root.

Benzoic acid, natural or true: The amount of substance taken for the chlorine test is too small, it should be increased to 1 Gm. The manufacturers of synthetic benzoic acid are in a position to reduce the amount of chlorinated products to a minimum and with 0.5 Gms. of substance taken, an adulteration of true benzoic acid with the synthetic product can hardly be detected.

Benzoin: A shipment was rejected yielding 28 per cent. of ash.

Boric acid: One large lot had to be rejected, containing more than the allowed amount of calcium and iron. In connection with boric acid we

wish to call attention to the following fact. From time to time it occurs that the boric acid, when moistened and mixed with a certain green aniline color, bleaches the coloring matter on becoming dried, (on wetting the green color reappears). As yet we have been unable to identify the substance producing this effect.

Calx sulphurata: A few samples contained from 45 to 50 per cent. CaS only.

Camphor: Bohrish in the Pharmaceutische Centralhalle 1907, p. 26, reports on a new reaction to distinguish natural from synthetic camphor based on the action of vanillin-hydrochloric acid at certain temperatures.

Cantharides: A process for determination of cantharidin should be given.

Cerium oxalate: Two shipments were rejected on account of an undue amount of arsenic present.

Cinchona: The assay process for this drug could be improved considerably. The corrections increase the amount of the ether-chloroform mixture to bring the alkaloids into solution. But either the proportion of the bark to the solvent (1:20) is still insufficient to effect a complete solution of the alkaloids or the menstruum does not penetrate the cells sufficiently to extract the alkaloids completely, for we invariably found that with high grade barks Fromme's method (Caesar & Löretz, Geschäftsberichte 1906) yielded about 1 per cent. more of alkaloids than the improved U. S. P. method. By this method the total alkaloids are determined, but by some slight modification it could be applied for the ether-soluble alkaloids also.

Coca Leaves: We have experienced no difficulty in obtaining high grade leaves, assaying as high as 0.8–0.9 per cent. of ether-soluble alkaloids.

Colchichine: The solubility in water 1:22 could be reduced, as an alkaloid which is soluble 1:12 can easily be made.

Copaiba: It is to be regretted that there is no reliable test for rosin. As was pointed out in a publication from this laboratory some years ago, Bosetti's test gives fairly good results, but this test cannot be carried out very easily. Some months ago L. E. Walburn published an article in the Pharmaceutische Centralhalle about the detection of rosin in copaiba, and he gives a method which worked very well in his hands with several brands of the balsam. As yet we have had very little opportunity to try this test, but will do so in the near future, and publish the results to complete the previous paper. In addition to this, we will also try the different modifications for the gurjun test, as communicated recently by Turner and others.

Extract of Belladonna Leaves: Although the standard for belladonna leaves has been cut down to 0.3 per cent., the standard for the extract of the drug has remained 1.4 per cent. As belladonna leaves by regular percolation frequently yield 25 per cent. of extractive matter, an extract of

the required strength of these cases could not be obtained from leaves assaying as low as 0.3 per cent. of total alkaloids.

Fluidextract of Cinchona: The menstruum used by the U. S. P. does not exhaust the drug. We made several experiments with diluted hydrochloric acid and alcohol as menstruum, and recommended by v. d. Widen and others, and found that about 15 per cent. more of the alkaloids are extracted by using an aqueous-alcoholic-hydrochloric menstruum than by applying the official method. Besides this, the extract has a better appearance, etc., than the fluidextract of the U. S. P.

Hyoscine Hydrobromide: As long as the U. S. P. gave the M. P. of the salt as 179.7° , we were frequently supplied with an optically inactive article. The corrections give the right M. P. of an optically active salt. M. P., $191-192^{\circ}$. Although the optical rotation has in no way any influence on the physiological activity, it is preferable to use a salt, which has in a 6.5 per cent. aqueous solution in a 100-Mm. tube at 15.8° C., a specific rotation of 25.5° . By this determination any adulteration with the dangerous apoeptropine will be shown, which reduces the optical activity (Kobert). Another test for apoeptropine was given recently by Kressel (Archiv. der Internationalen Pharmacodinamik) based on the oxidation of apoeptropine by potassium permanganate solution.

Jalap: The requirement of the U. S. P. for this root has been cut down to 7 per cent. of resin. Notwithstanding this reduction, it is very difficult to obtain a root with the required amount of resin, although occasionally we receive a few shipments with as high as 10 per cent. and more of resin. Moore examined 276 samples of the root, and found figures ranging from 15.63-2.1 per cent., with an average of 5.95 per cent. Only 26 of 276 samples assayed above 9 per cent., as required by the Ph. Br.

Volatile Oils: Much could be written about these substances, but we prefer to reserve any criticism until we have more data at hand. Only a few words may be said about santal oil, as we manufacture this article on a large scale, and consequently have more experience with this article. We pointed out in a publication last year in the Proc. of the A. Ph. A., that only little reliance could be placed upon the optical rotation of the oil. Schimmel & Co., however, in their "Semi-Annual Reports, 1907," replied to our statements, that the oil should have the proper optical activity, i. e., 16° to 20° . During the time since we published the aforesaid article, we have distilled many other different lots of genuine East Indian sandalwood, and in several instances we have obtained oils which, answering all the other tests of the U. S. P., did not come up to the required rotation. We must, therefore, claim again, that the optical activity of 16° to 20° , as given in the U. S. P., is not a criterion of the value of the santal oil.

Quinine and its Salts: We have experienced very little difficulty in obtaining these chemicals with a purity as required by the U. S. P. But we

wish to point out again that the amount of 7 Cc. of a 10 per cent. ammonia water as allowed by the U. S. P. for redissolving the other cinchona alkaloids in the Kerner's test is entirely too large. There is not one other pharmacopœia in existence which has so liberal a test.

Resin of Scammony: We would like to call attention to a resin made from *Radix Scammoniae Mexicana*, or *Radix Orizabensis*, which, although not as soluble in ether and chloroform as the resin made from scammony has the same therapeutic value (Guignes).

Spiritus Glycerilis Nitratis: An assay method should be given based on the saponification of the glyceryl nitrate by alcoholic caustic potash.

Mr. Turner said in regard to Mr. Dohme's suggestion on his test on detection of gurjun balsam in copaiba, that he would like to state that the test was tried on samples of copaiba of different ages, (up to two years old) and proved satisfactory.

Mr. Puckner inquired of Mr. Dohme as to whether tablets of nitroglycerin decomposed as rapidly as was claimed. He stated that he had asked that question in conversation with a man very competent in physiological tests, and he had reported that the alleged worthlessness of these tablets was very much exaggerated; that he had repeatedly used them, and had found them exceedingly accurate. Mr. Dohme replied that he had, on a number of occasions, examined into this matter, and had found that the claims of the deterioration in nitroglycerin were very much exaggerated; that out of fifteen or twenty samples examined, he had found only two where there was any appreciable deterioration; one had deteriorated about forty per cent., and the other something like that figure. In the large majority of cases they were found to be practically as rich or as strong as called for by the label; in other words, they bore out the statement as to the physiological test referred to by Mr. Puckner.

The Chair asked Mr. Dohme if he had found any samples of copaiba adulterated with petrolatum, saying he had been informed that such an adulterant had been used. Mr. Dohme responded that he had found one case of such adulteration, but that was a long while ago. He did not make a quantitative examination, but it looked very much like this substance.

Mr. Kebler said that before the Pure Food and Drug Law went into effect there was sold in the United States a large quantity of copaiba which was questioned by many of the chemists, but at the same time the tests did not show it was an adulterated article. When the new law went into effect, however, virtually all of that copaiba was withdrawn.

Mr. Kebler said he wished to impress the point as to all imported drugs that the mere fact that an adulterated drug might pass the customs inspection did not make it immune, under the law, and that such drugs would be held up afterwards wherever found, when this fact was discovered. He

added, however, in answer to a question by Mr. Asher, that when such drugs were distributed in the State of the port of entry, the Government could not touch it.

As to boric acid, he said they had examined a number of such samples in the Drug Laboratory, and had found them to comply with the tests at present rigidly applied.

Continuing, Mr. Kebler said he thought the words "for technical use," referred to in the report of the Committee on Drug Market (as he remembered), had been largely misapplied, but he did not know whether anything would, or could, be done to correct this abuse. A great many people, he thought, would be deceived by this phrase. The manufacturer will label it "for technical use," but as it passes along the line that will be forgotten, and some man will be caught with these inferior drugs on his hands. Whose fault it would be he did not know; that would have to be settled hereafter.

Another point in connection with technical use was this: There is a provision in the law that allows a preparation bearing a pharmaceutical name to be put on the market if it is properly labeled—or, as they have interpreted the statute, states in what way it deviates from the pharmacopœial standard. In a number of cases manufacturers had contended that their preparations were ninety-nine to one hundred per cent. pure, and wanted to so label them, contending that they would be thus complying with the law. That did not mean anything, he said; such preparations might contain a large per cent. of impurities, and yet test ninety-nine and one hundred per cent. pure. What is required by law is this: That whenever a preparation contains anything that is forbidden by the Pharmacopœia, that fact must be declared in the label.

Mr. Kebler referred to the fact brought out by one of the speakers yesterday to the effect that, if laudanum contained only five per cent. opium, all that would be necessary to do would be for the manufacturer to so label it. But that is not sufficient under the Food and Drug Law. If the manufacturer does that, he will be required to say "One-half Strength;" or if he uses only two and one-half per cent., he will be required to say "One-quarter Strength." The manufacturers say that if this is required of them they will drop that system, because it will kill their goods. But that is the information the public wants. To say five, ten or twenty per cent., means nothing to the consumer; but when you say one-half or one-quarter strength, they will begin to "sit up and take notice."

Mr. Chas. E. Caspari asked Mr. Kebler how those essential oils for which the Pharmacopœia provided no assay, but which did not come up to the pharmacopœial requirements as to specific gravity, solubility in alcohol, etc., should be labeled—essential oils where, though not adulterated, the specific ingredients could not be determined with accuracy. He asked if it would be sufficient to put the correct specific gravity on the

label. Mr. Kebler responded that this question had not been raised specifically before his department in Washington as yet, and he could answer only in a general way. The question of the variation of essential oils was an interesting one, and they had had a number of cases before the Drug Laboratory, and their investigations, in some cases at least, had shown that the contention made was not well founded—in other words, that the oil was not adulterated.

The next paper called for was one on the "Literature of the Alkaloids for the Past Year," by Mr. Puckner, which paper was also left over from the morning session. The Chair stated that this paper had been prepared at the express request of Chairman Hunt; that it was a paper of considerable length, and could not be abstracted to advantage on account of its peculiar character, and suggested that it be received for publication, as a valuable contribution to the proceedings. This suggestion was adopted. The text of the paper here follows:

A REVIEW OF THE LITERATURE ON THE ESTIMATION OF ALKALOIDS FOR THE YEAR 1906.

BY W. A. PUCKNER, CHICAGO, ILL.

The year 1905 having brought forth the eighth decennial revision of the United States Pharmacopœia, it was to be expected that the year 1906 would bring out a critical review of the methods of estimating alkaloids contained in the book and the alkaloid standards laid down. To no small extent the interest in these methods and standards is due to the formal recognition which the Pharmacopœia has received in the Pure Food and Drugs Act, June 30, 1906, and the expected enforcement of the Act.

Murmurs of discontent with the newly-adopted methods culminated in what might be called an indignation meeting when the Section on Scientific Papers of the American Pharmaceutical Association at the Indianapolis meeting took up the subject. As a basis for discussion that portion of the report of the A. Ph. A. Committee on the United States Pharmacopœia* was read which referred to alkaloidal standards and methods of standardization. The discussion opened with the presentation of a resolution requesting the Revision Committee of the United States Pharmacopœia to re-examine the official assay processes and, if found desirable, to publish a supplement to the Pharmacopœia containing changes deemed important. A general discussion followed, in which the weak points of the official assay processes were emphasized with only an occasional word of praise for their advantage. In the main it appeared that the methods were faulty in detail rather than principle. In the end the chairman of the Revision Committee of the United States Pharmacopœia explained that this committee had authority to make necessary changes, and promised that the modifications

* Report of Com. on U. S. P., Proc. A. Ph. A. 1906, vol. 54, p. 437.

and corrections proposed would be considered and any errors in the official methods of assay corrected.

Alkaloidal Standards. Publications in regard to the practicability of the standards adopted for fluidextracts in the U. S. P. VIII,* the quality of the alkaloidal drugs on the market,† the preparation of tinctures from assayed drugs or from fluidextracts‡ and the relation between the assay standard for the drug and its preparations|| will not be noted as they apply to specific drugs.

Apparatus. F. R. Eldred§ proposes a new assay percolator, similar to the one proposed by H. M. Gordin,¶ designed to permit in one container the maceration and the subsequent percolation prescribed in the pharmacopœia for the assay of many drugs. H. M. Gordin** has designed two separatory funnels. No. 1 has two outlets and permits either the aqueous or the ethereal liquid to be drawn off without contamination of the immiscible solvents. No. 2 is so constructed that it may be used as a distilling flask or as a separatory funnel.

Herman Gardner†† has devised a bottle for the precipitation of morphine in opium assays calculated to facilitate its removal and to minimize the liability of loss.

General Methods. D. Jonescu‡‡ adapts to the estimation of quinine and caffeine (also antipyrine) the method of H. Thoms|| based on the precipitation of alkaloids with potassium-bismuth iodide solution, decomposition of the precipitate with alkali and extraction of the alkaloid with ether. Using 1 Gm. of alkaloid he recovered 0.9405 Gm. quinine and 0.9546 Gm. caffeine.

H. Matthes and Otto Ramstedt §§ also have studied the method of Thoms. They compare the results by this method when applied to extracts of coca, belladonna and henbane with the result obtained with other methods. While the Thom's method gives good results it is too complicated. The authors also take up the estimation of tannin and organic acid in narcotic extracts as proposed by Thoms and conclude that, with

* Report of Com. on U. S. P., Proc. A. Ph. A. 1906, vol. 54, p. 437.

† Report of Com. on Drug Adulteration, Proc. A. Ph. A. 1906, vol. 54, p. 329.

‡ Report of Com. on U. S. P., Proc. A. Ph. A. 1906, vol. 54, p. 444.

|| Frank X. Moerk, Proc. Pa. Pharm. Asso. 1906. (Am. J. Pharm. 1906, vol. 78, p. 379.)

§ J. Am. Chem. Soc. 1906, vol. 28, p. 187 (Proc. A. Ph. A. 1906, vol. 54, p. 593).

¶ Proc. A. Ph. A., 1905, vol. 53, p. 386.

** Proc. A. Ph. A. 1906, vol. 54, p. 378.

†† Pharm. J. 1906, vol. 76, p. 548.

‡‡ Ber. d. d. pharm. Ges. 1906, vol. 16, p. 130.

||| Pharm. Rev. 1906, vol. 24, p. 2333.

§§ Pharm. Ztg. 1906, vol. 51, p. 1031.

the present knowledge of the constituents of vegetable drugs, these determinations are of little value.

A comparison of the method of Thoms with the methods of the German and Austrian Pharmacopœias appears below (see *Belladonna*).

Edward Schaer * discusses the solubility of alkaloidal salts in immiscible solvents, and outlines the result of an extended series of experiments made by A. Simmer under his direction. With the exception of a few "weak" alkaloids, such as caffeine and colchicine, it was generally held that alkaloids in the free state (alkaloidal hydroxides) were soluble in ether, chloroform, etc., while alkaloid salts were insoluble in these solvents. More careful work has shown that this is true only in a general way. The solubilities of alkaloids are largely dependent on two properties. First, alkaloid salts when dissolved in water are hydrolyzed into free acid and alkaloid hydroxide, and the latter, or its anhydride, dissolves in the immiscible solvent. The extent to which this occurs depends on the basic strength of the alkaloid and on the strength of the acid combined with it; an excess of acid decreases or prevents it. Second, many alkaloid salts are themselves soluble in chloroform and, though to a less extent, in ether. This is true especially of the chlorides, and in recognition of this, sulphuric acid, and not hydrochloric acid, is used to abstract alkaloids from their chloroform solution in the valuation of drugs. Schaer gives the behavior of alkaloids when combined with different acids, and also the action of immiscible solvents other than ether and chloroform.

A. Simmer † details some of the work above referred to by Schaer. Experiments are also reported on the decomposition of alkaloids by chloroform and the decomposition of chloroform by alkaloids. In the latter case hydrochloric acid is formed.

H. M. Gordin ‡ notes that some of the official assay methods "do not work," and that some are too complicated. He proposes a modification of the official method for belladonna patterned after the processes of the German Pharmacopœia, but in which sodium carbonate or sodium hydroxide instead of ammonium hydroxide is used to set free the alkaloid from the aqueous solution of their salts. While ammonium hydroxide is taken up by chloroform or ether-chloroform, the fixed alkalies are not soluble, and hence the alkaloid may be titrated in this solution after partial distillation to expel the traces of ammonia carried over from the drug. Using the specially constructed separatory funnels, described above, the method is stated to be simple, short and exact. The details for the valuation of aconite, ipecac, and for fluidextracts of pilocarpus, cinchona and physostigma, are noted below.

* Proc. A. Ph. A. 1906, vol. 54, p. 425.

† Arch. d. Pharm., vol. 244, p. 672; from Chem. Centrbl. 1907, 1, p. 827.

‡ Proc. A. Ph. A., 1906, vol. 54, p. 377.

Indicators. A. B. Lyons * and J. M. Francis † condemn the adoption in the pharmacopœial assay processes of hematoxylin as indicator in the titration of alkaloids, and believe that cochineal is to be preferred. C. E. Vanderkleed ‡ describes the method of using iodeosin in the titration of alkaloids. For the titration of morphine Bernström § recommends iodeosin, while Asher || uses hematoxylin.

Aconite. The official method for the valuation of aconite has been criticised because it is tedious; thus, in discussing this subject at Indianapolis, ¶ C. E. Caspari stated that the filtration of the aqueous liquid required more than three days; this Chas. Caspari, Jr., overcomes by the use of pumice, but J. M. Francis believes that it is contrary to law to so modify the official method. Similar criticisms of the official assay process have been made by W. T. Hankey.**

H. M. Gordin, †† using specially constructed apparatus (see Apparatus), sets free the alkaloid with sodium carbonate and extracts it with a mixture of three volumes of ether and one of chloroform.

As regards the alkaloidal content of aconite (root) the Committee on Drug Adulteration reports ‡‡ assays showing variations from 0.20 to 0.65 per cent. with an average of 0.51 per cent. G. Fromme §§ reports that five lots assayed 0.530, 0.617, 0.638, 0.775 and 0.797 per cent., an average of 0.631 per cent. Comments on the official standard for fluidextract of aconite received by the Committee on United States Pharmacopœia || indicate that the standard can readily be maintained.

Belladonna, Hyoscyamus and Stramonium. Karl Dietrich ¶¶ has compared the assay methods for extracts of belladonna and hyoscyamus in the new Austrian Pharmacopœia, the German Pharmacopœia and the bismuth method of Thoms (see German Methods). The method of the Austrian Pharmacopœia directs the extract to be dissolved in a little water and then diluted with much alcohol. An aliquot part of the clear solution is diluted with water and heated on a water-bath to expel the alcohol. The residual solution is rendered alkaline with sodium carbonate and extracted with

* Proc. A. Ph. A., 1906, vol. 54, p. 441.

† Proc. A. Ph. A., 1906, vol. 54, p. 454.

‡ Apothecary, 1906, vol. 3, p. 510.

§ Pharm. Centrhalles, 1906, vol. 47, p. 632.

|| Western Drug., 1906, vol. 28, p. 453.

¶ Proc. A. Ph. A., 1906, vol. 54, p. 455-6.

** Am. Drug., 1906, vol. 49, 1, p. 360.

†† Proc. A. Ph. A., 1906, vol. 54, p. 379.

‡‡ Proc. A. Ph. A., 1906, vol. 54, p. 333.

§§ Cäsar & Loretz, *Geschäfts-Bericht*, 1906, p. 70.

|| Proc. A. Ph. A., 1906, vol. 54, p. 438.

¶¶ Helfenberger *Annalen*, 1905 (Pharm. Centrhalles, 1906, vol. 47, p. 916).

chloroform. From the chloroform solution the alkaloid is extracted with very dilute hydrochloric acid. The hydrochloric acid solution of the alkaloid is rendered alkaline with sodium carbonate and the alkaloid abstracted with chloroform. The chloroform is evaporated at room temperature, the residue dried at 100 degrees C. and weighed. The results obtained with this method agree closely with those obtained with the Thoms' method. The results by the method of the German Pharmacopœia are liable to be excessive because bases other than alkaloids are estimated. The potassium-bismuth iodide method of Thoms was applied to extracts of belladonna and of henbane as follows: To 4 Gm. of dry extract (extractum siccum) are added 50 Cc. 90 per cent. alcohol, the mixture shaken frequently during three hours and filtered. Then 25 Cc. of the filtrate, taken to represent 2 Gm. extract, are heated on a water-bath until the alcohol has been driven off. The residue is taken up with 50 Cc. water and to this added 10 Cc. 10 per cent. sulphuric acid and 5 Cc. potassium-bismuth iodide solution (prepared by pouring a solution of 80 Gm. bismuth subnitrate in 200 Gm. nitric acid, sp. gr. 1.18, into a concentrated solution of 272 Gm. potassium iodide in water and, after removal of potassium nitrate crystals formed, diluting to 1000 Cc.). The precipitate is collected and with the filter placed in a cylinder and treated with 20 Cc. 15 per cent. sodium hydroxide solution and 10 Gm. coarsely powdered crystallized sodium carbonate. Next 50 Cc. ether are added and the whole shaken frequently during three hours. Now about 100 Cc. water, 20 Cc. ether and 5 drops iodeosin solution are measured into a stoppered flask and any red color, due to the alkalinity of the glass, destroyed by addition of a few drops of $\frac{1}{16}$ normal hydrochloric acid. To this 25 Cc. of the ethereal alkaloid solution, representing 1 Gm. of extract, are added and its alkalinity determined with one-hundredth normal hydrochloric acid.

G. Fromme* reiterates that for chlorophyll-bearing drugs higher figures are obtained when the drug is extracted with ether or chloroform and ether in presence of alkali, and ether or ether-chloroform solution of the alkaloid extracted with a known excess of volumetric acid, the excess of acid determined and the amount of alkaloid calculated from the volume of acid consumed. In part, these high results are due to ammonium compounds contained in the drug from which ammonia is liberated, carried over and estimated. But in part, Fromme believes the error may be due to the presence of oils, fats or waxes in leaf drugs which are saponified by alkali forming soaps, which are soluble in ether, etc. If such an ether or ether chloroform solution is extracted with volumetric acid a portion of the acid will be used up in the decomposition of the soap. A considerable series of experiments are reported showing that, when belladonna leaves or henbane leaves are macerated with ether and sodium hydroxide, high

* Caesar and Loretz Geschäftsbericht 1906, p. 24.

results are obtained unless the ether solution is brought to complete dryness prior to the titration.

Another comprehensive series of experiments is offered relative to the decomposition of mydriatic alkaloids. It is concluded that these alkaloids may be combined with acid and again liberated in the free state with none or at least very slight decomposition, and that from an alkaline aqueous solution chloroform extracts the alkaloids completely.

W. T. Hankey* criticises the U. S. P. assay method for belladonna leaves. He also reports that the alkaloid content of ten lots of belladonna leaves ranged from 0.230 to 0.516 per cent. with an average of 0.334 per cent. Reports on the alkaloidal value of belladonna leaf and root are also made by the A. Ph. A. Committee on Drug Adulteration† and the A. Ph. A. Committee on U. S. Pharmacopœia‡. G. Fromme§ reports the assay on 10 lots of belladonna root ranging from 0.07 to 0.94 per cent. with an average of 0.56 per cent. Another report|| states that three lots of belladonna leaves assayed 0.40, 0.36 and 0.37, and 7 lots of belladonna root ranged from 0.55 to 0.38, averaging 0.48 per cent. Reports on the alkaloidal value of hyoscyamus and stramonium are made by the A. Ph. A. Committee on Drug Adulteration¶ and on U. S. Pharmacopœia**.

Cinchona. J. M. Francis†† and A. B. Lyons‡‡ criticise the U. S. P. assay process, especially as regards the determination of ether-soluble alkaloids. Lyons raises the important point that temperature materially influences the determination of ether-soluble alkaloids and recommends that the liquids should be cooled to 15 degrees C. and kept at this temperature during the digestion. He also recommends that the mixture be shaken continuously and not "at intervals," as now specified.

In the U. S. P. valuation of fluidextract of cinchona the fluidextract is shaken with ether, chloroform and ammonia water, and an aliquot part taken for the determination. Considering the use of aliquot parts of ethereal liquids objectionable whenever it can be avoided, H. M. Gordin §§ modifies the official process by adding to 5 Cc. of fluidextract 2 Cc. of a 10 per cent. sodium hydroxide solution and extracting with three portions, 25 Cc. each, of a mixture of three volumes of ether and one volume of

* Am. Drug. 1906, vol. 49, p. 360.

† Proc. A. Ph. A. 1906, vol. 54, p. 334.

‡ Proc. A. Ph. A. 1906, vol. 54, p. 438.

§ Caesar and Loretz Geschäftsbericht 1906, p. 45.

|| Smith, Kline and French report for 1906, p. 13.

¶ Proc. A. Ph. A. 1906, vol. 54, p. 337 and 347.

** Proc. A. Ph. A. 1906, vol. 54, p. 439 and 440.

†† Proc. B. Ph. A. 1906, vol. 54, p. 453.

‡‡ Proc. A. Ph. A. 1906, vol. 54, p. 440.

§§ Proc. A. Ph. A. 1906, vol. 54, p. 380.

chloroform. The ethereal solution of alkaloids is shaken out with three portions of dilute sulphuric acid. The sulphuric acid solution is made alkaline and extracted with chloroform. The chloroform is distilled from a tared vessel and the residue dried and weighed.

A. Panchaud* has determined that cinchona alkaloids readily decompose chloroform according to the equation $\text{CHCl}_3 + \text{O} = \text{COCl}_2 + \text{HCl}$. If cinchona alkaloids are dissolved in chloroform in the evening and titrated the next morning, from 20 to 100 per cent. of the alkaloid will be found to have been neutralized by the hydrochloric acid produced in the decomposition of the chloroform. Since the decomposition of 0.0229 Gm. chloroform will produce sufficient hydrochloric acid to neutralize 0.120 Gm. alkaloids the error liable to be introduced thereby in the volumetric estimation of cinchona alkaloids is obvious. Panchaud therefore cautions that any solutions of cinchona alkaloids which contain chloroform must be evaporated at once.

N. Matolcsy† proposes the use of amyl alcohol for the extraction of cinchona alkaloids in place of chloroform and ether. Amyl alcohol when shaken with the sodium chloride solution increases about one per cent. in volume. He directs, therefore, that the aqueous solution be saturated with sodium chloride, and that a correspondingly smaller volume of amyl alcohol be used in the assay; thus instead of 60 Cc. only 59.4 Cc. are directed. The following method is proposed: 4 Gm. of powdered drug are boiled with 30 Cc. water, to which have been added a few drops diluted hydrochloric acid. The mixture is filtered, and sufficient water poured through the filter to produce 50 Cc. of filtrate. The filtrate is rendered alkaline with milk of lime and then treated with 59.4 Cc. amyl alcohol. 20 Gm. of sodium chloride are added to the liquid, the mixture shaken until saturated, and the two liquids permitted to separate, using a centrifuge to facilitate the separation. Now 30 Cc. of the amyl alcohol solution is pipetted off, evaporated to dryness, and the residue dried at 100° C. To determine in this residue of total cinchona alkaloids the amount of quinine and quinidine, it is dissolved in a little hydrochloric acid, diluted to 50 Cc., and rendered alkaline with sodium hydroxide. 20 Gm. sodium chloride and 20.2 Cc. absolute ether are now added and mixed by shaking. 10 Cc. of the ether solution are pipetted into a tared vessel, the ether evaporated, and the residue dried at 100° C.

For the determination of total cinchona alkaloids, the following short method is proposed: ‡ 2.5 Gm. powdered cinchona are digested for about one hour with 10 Cc. water and 2 Cc. 25 per cent., hydrochloric acid, at a

* Schweiz. Wochenschr. f. Pharm., vol. 44, p. 580; Chem. Centrbl. 1906, 2, p. 1212.

† Pharm. Post, 1906, No. 22; Pharm. Ztg., 1906, vol. 51, p. 612.

‡ Jahresbericht der Firma Philipp Röder in Wein-Klosterneuburg Pharm. Ztg. 1907, vol. 52, p. 354.

temperature of 40 to 45° C. The mixture is allowed to cool, 65 Gm. ether-chloroform mixture (3:1) added, shaken once and then the acid neutralized with 7 Cc. 15 per cent. sodium hydroxide solution. Now one Gm. powdered tragacanth is added, and the mixture shaken thoroughly, until the powder agglutinates and the ether-chloroform is perfectly clear. The ether-chloroform is poured through a dry plaited filter, and 52 Gms. (= 2 gram drug) extracted with four portions, 10 Cc. each, of one or two per cent. hydrochloric acid. The united hydrochloric acid extractions are rendered alkaline with sodium hydroxide and extracted with 20, 10, 5, 5 Cc. chloroform. The united chloroform extractions are evaporated in a tared flask and dried for two hours at 100° C. The weight obtained multiplied by 50 gives the per cent. of total alkaloids.

Florence* proposes two methods for the valuation of cinchona; one a short method giving approximate results, the other, an exact method. In the short method 12 Gm. finely powdered drug are mixed with 120 Gm. pure alcohol-free ether, then 10 Cc. 10 per cent. sodium hydroxide solution is added, the flask stoppered and shaken repeatedly during one hour. Then 10 Cc. water are added and, when the liquids have formed separate layers, the ether is poured off. The ether is extracted with 20 to 30 Cc. lime water, whereby the resinous matter is separated and the liquid rendered almost colorless. 100 Gm. of the ethereal liquid is transferred to a wide-necked stoppered flask, 30 C. water added, and then tenth-normal ethereal oxalic acid solution (prepared as needed by dissolving 0.63 Gm. pure crystallized oxalic acid in sufficient ether to make 100 Cc.), run in until it causes no further turbidity or until a drop placed on litmus paper shows neutrality. In this way the alkaloids are completely precipitated in the form of oxalates, dissolving with the exception of quinine oxalate in the aqueous layer on shaking. To obtain the weight of total alkaloid in 10 Gm. drug, the number of Cc. of oxalic acid solution used is multiplied by 0.035, experiment having shown that this is the weight of cinchona alkaloids precipitated by 1 Cc. of ethereal oxalic acid solution. For the determination of quinine the precipitated quinine oxalate is collected on a tared filter, washed well, dried and weighed. 1 Gm. quinine oxalate corresponds to 0.878 Gm. pure quinine.

In the exact method the drug is treated in an extraction apparatus with a mixture of ether, four parts, and chloroform, one part, until a portion of the percolate is not rendered turbid by addition of ethereal oxalic acid solution. The ethereal liquid is then extracted in a separatory funnel with three portions of lime water, the latter extracted twice with a little ether, the ethereal liquids united, brought to dryness, and the residue weighed as total alkaloids. To determine the quinine the total alkaloids are dissolved in ether, or in ether to which one-fifth its volume of chloroform has been

* Bull. des scienc. pharmacolog., 1906, 365 (Pharm. Centrallhalle, 1907, vol. 48, p. 405).

added and 30 Cc. of an aqueous saturated solution of quinine oxalate, and then the quinine precipitated with the ethereal oxalic acid solution as in the short method. The ether is decanted to a tared filter, then the precipitate transferred to the filter and washed with saturated solution of quinine oxalate until the washings are rendered no more turbid on the addition of lime water than a saturated solution of quinine oxalate when treated in the same way. The precipitate is allowed to drain, the filter and precipitate pressed between filter paper to absorb most of the retained wash fluid and weighed. It is then dried finally at 100° C. and again weighed. Since 1 Cc. water dissolved 0.00069 Gm. quinine oxalate there is subtracted from the last weight 0.00069 Gm. for every Gm. difference between the first and second weight, and also the weight of the filter—the remainder is the weight of quinine oxalate. The quinine oxalate solution is prepared by treating quinine sulphate with sodium hydroxide and ether, precipitating the ether solution of quinine with an ether solution of oxalic acid, collecting the precipitate, washing it with ether and drying it.

For the determination of the amount of quinine in wine, J. Evan * gives directions.

Coca. A comparison of several assay methods by Matthes and Ramstedt has been noted under "General Methods." The A. Ph. A. Committee on the U. S. Pharmacopœia † and the A. Ph. A. Committee on Drug Adulteration ‡ report on the alkaloid content of the drug.

Coffee, Guarana, Kola, etc. The details of estimating caffeine in pharmaceutical products has received some attention. C. E. Vanderkleed and J. L. Turner || have worked out the details for the estimation of caffeine in effervescing salts. F. Zernik § has determined the composition of Migrainin, a mixture of caffeine and antipyrine and its substitutes. To estimate caffeine, he dissolves Migrainin in a concentrated aqueous solution of potassium nitrate and precipitates the antipyrine by addition of an acid solution of mercuric nitrate. From the filtrate the caffeine is extracted with chloroform, the chloroform evaporated and the residue dried at 90° C. Since the residue was found to contain small quantities of antipyrine-mercuric nitrate, it was dissolved in water acidulated with nitric acid and the mercury precipitated by means of hydrogen sulphide and weighed as mercuric sulphide. From weight of mercuric sulphide, two parts of which correspond to 4.42 parts of $C_{11}H_{12}N_2O \cdot (NO_3)_2Hg$, the amount of the double compound of caffeine and mercuric nitrate is calculated and deducted from the weight of the crude caffeine. The extraction

* Pharm. J., 1906, vol. 77, p. 439.

† Proc. A. Ph. A., 1906, vol. 54, p. 439.

‡ Proc. A. Ph. A., 1906, vol. 54, p. 337.

|| Proc. A. Ph. A., 1906, vol. 54, p. 414.

§ Apoth. Ztg., 1906, vol. 21, p. 686.

of caffeine by chloroform is quite complete because of the use of potassium nitrate.

P. Waentig* discusses the estimation of caffeine in coffee. He criticises the methods of Hilger and Juckenack, Katz and C. C. Keller. Waentig demonstrated that the use of lead hydroxide in the method of Katz does not cause decomposition of caffeine. He recommends the substitution of carbon tetrachloride for chloroform in the extraction of caffeine. Replying to the criticism of Waentig, C. C. Keller† states that the method was recommended for the estimation of caffeine in tea, and should, of course, not be used for the estimation of caffeine in coffee.

Carl Wolff‡ publishes a simplified method for the estimation of caffeine in coffee. In conclusion, Wolff cautions that the substance extracted by ethyl acetate, or by chloroform, must not be considered to be pure caffeine. Instead, its nitrogen content must be determined and the caffeine calculated therefrom. H. C. Lythgoe, § has also published experiments relative to the estimation of caffeine in coffee.

Colchicum. To eliminate the errors contained in a method previously published, Panchaud || has determined the solubility of colchicine in mixtures of chloroform, ether and petroleum-ether. He finds that petroleum-ether having a boiling-point of 50 to 60° C. must be used in the assay and the ether must be completely dehydrated over metallic sodium. For the estimation of colchicine he directs that 15 Gm. coarsely powdered colchicum seeds be treated in a flask with 150 Gm. chloroform, the mixture shaken frequently during thirty minutes, then 6 Cc. 10 per cent. ammonia water added and the mixture shaken thoroughly. After occasional shaking during one-half hour, 100 Gms. are to be filtered off through a plain filter of 20 Cm. diameter into a 200-Cc. Erlenmeyer flask, the funnel being kept covered. The solution is distilled to complete dryness and the residue dissolved in one Gm. dry chloroform, one Gm. dry ether added, and then 30 Gm. dry petroleum-ether. The liquid and precipitate are transferred to a plain filter of 8 Cm. diameter, using further petroleum-ether to complete the transfer. The funnel containing the precipitate is placed on an empty flask and the precipitate dissolved with warm chloroform, care being taken that it is completely dissolved by washing the edge of the filter with chloroform. The chloroformic solution is distilled and the residue dissolved in 15 drops of chloroform, 2 Gm. absolute ether added and, after solution, 30 Cc. dry petroleum-ether. The liquid and

* Pharm. Centralh., 1906, vol. 47, p. 810.

† Pharm. Centralh., 1906, vol. 48, p. 859.

‡ Chem. Centrbl., 1906, 2, 566, from Z. f. offentl. Chem., 12, 186.

§ U. S. Dept. of Agricult. Bul., 99 (J. Am. Chem. Soc. 1906, 28 R., 512).

|| Schweiz. Wochenschr. f. Chem. u. Pharm., 1906, 564, Pharm. Centrhl., 1907, vol. 48, p. 75.

precipitate are poured on a tared, plain filter of 8 Cm. diameter. Floccules adhering to the flask are dissolved in 5 drops of chloroform, one Gm. ether added and then 10 Gm. dry petroleum-ether; the mixture transferred to the first filter and the precipitate washed with a little petroleum-ether. The weight of the precipitate, plus .0022 Gm. (correction for solubility of colchicine in the quantity of solvent used), multiplied by 10, furnishes the colchicine content of the drug.

Fromme * reports that the better grades of colchicum seeds contain 0.696 to 0.901 per cent. colchicine.

Colombo. J. Gadamer † and E. Günzel ‡ have studied the alkaloid contained in colombo, and the latter has made some attempt to determine its amount.

Conium. The A. Ph. A. Committee on the U. S. Pharmacopœia § and the A. Ph. A. Committee on Drug Adulteration || have reported on the alkaloidal content of conium.

Ergot. While not analytical in character, considerable work of great importance has been done during the past year in regard to the question as to whether or not the activity of ergot is due to an alkaloid, and whether, therefore, the valuation of ergot may be based on its alkaloid content. E. Vahlen ¶ concludes that the specific ergot action is due to a principle which he calls clavin, and which, while it contains nitrogen, is neutral, not alkaloidal in character, and readily soluble in water. The process for the manufacture of this product has even been patented by him.** A very extensive examination of the constituents of ergot has been made by F. Kraft.†† Kraft concludes that ergot contains two alkaloids—one the crystallized ergotinin of Tanret—and an amorphous alkaloid. He finds that the specific action of ergot is not due to these alkaloids, but that other objectionable properties of the drug are due to them. In conclusion, he states that the specific action of ergot must be due to a water-soluble substance which cannot be shaken out with ether, and which is neither a base, an acid nor a phenol, and he is inclined to accept the work of Vahlen, according to which clavin is the essential constituent of ergot. These conclusions, however, are not accepted by G. Barger and H. H. Dale,‡‡ who, working in the Wellcome Research Labora-

* Cæsar & Loretz, *Geschäfts-Bericht*, 1906, p. 52.

† *Arch. der Pharm.*, 1906, 244, 255.

‡ *Arch. der Pharm.*, 1906, 244, 257.

§ *Proc. A. Ph. A.*, 1906, vol. 54, p. 337.

|| *Proc. A. Ph. A.*, 1906, vol. 54, p. 376.

¶ *Arch. f. exp. Pathol. u. Pharmak.*, 55, 131; *Chem. Centrbl.*, 1906, 2, 690.

** *Chem. Centrbl.*, 1906, 2, 1696.

†† *Arch. d. Pharm.*, 1906, vol. 244, p. 336.

‡‡ *Arch. d. Pharm.*, 1906, vol. 244, p. 550.

tories, have also investigated ergot most thoroughly. They are inclined to believe that the specific action of ergot is due to the amorphous alkaloid which they call ergotoxin.

Gelsemium. L. E. Sayre* reports some experiments on the estimation of the alkaloidal constituents of gelsemium.

Hydrastis. George Heyl† discusses the alkaloidal content of fluidextract of hydrastis. He examined a considerable number of specimens prepared by druggists and also by pharmaceutical manufacturers. He also gives the hydrastine content found by a large number of investigators, from all of which he concludes that a requirement of 2 per cent. of hydrastine for the fluidextract is not excessive. For the estimation of hydrastine he uses the following method: 7.5 Gm. fluidextract are concentrated to a thick extract in an Erlenmeyer flask. The residue is dissolved in 10 Cc. water, and then 10 Gm. petroleum-benzin and 50 Gm. ether added, the flask stoppered, rotated, and then 2.5 Gm. 10 per cent. ammonia water added. The mixture is shaken frequently during one hour, and then transferred to a separator having a capacity of 250 Cc. After separation has occurred the aqueous fluid is drawn off. Benzin-ether solution is passed through a pledget of fat-free cotton into a dry Erlenmeyer flask and the flask stoppered. 50 Gm. of this solution is weighed by difference into a separator and extracted with 10 Cc. of a mixture of one part hydrochloric acid and four parts water, with two further portions of water 5 Cc. each containing a few drops of dilute hydrochloric acid, and finally with 5 Cc. water. To the acid extractions are added 50 Gm. ether, 2.5 Gm. ammonia water, and the mixture shaken thoroughly and frequently. After one hour the fluid is transferred to a separator, the watery solution drawn off and the ether filtered through a small plaited filter, the funnel being kept covered. 50 Gm. of the filtrate are transferred into a tared vessel, the ether allowed to evaporate spontaneously, and the residue dried at 105° C. As a precaution, Heyl carried out all these operations as quickly as possible, although he has never observed the crystallization of hydrastine from the ether solution reported by other investigators. The work of Heyl has been criticised by A. W. van der Haar,‡ who considers the method of Linde—a modification of which Heyl adopted—antiquated. He prefers the method of Rusting-Smeets, carried out as follows: 10 Gm. of extract are mixed in a capacious tared vessel with 20 Cc. water, and the contents reduced by evaporation to from 10 to 11 Gm. Then 1.5 Cc. 12.5 per cent. hydrochloric acid are added, and after cooling, sufficient water to make 20 Gm. Now 0.5 infusorial earth is added, the mixture well shaken, filtered, and 10 Gm. transferred to a 100-Cc. vial. To this 4 Cc. 10 per cent. ammonia water and

* Proc. A. Ph. A., 1906, vol. 54, p. 383.

† Apoth. Ztg., 1906, vol. 21, p. 797.

‡ Apoth. Ztg., 1906, vol. 21, p. 1050.

25 Cc. ether are added, and after thorough shaking for a few minutes, 25 Cc. petroleum-ether, boiling at 50 to 75° C. After again agitating, 1.5 Gm. powdered tragacanth are added, the mixture shaken vigorously, 40 Cc. of the clear liquid transferred to a tared flask, and the contents reduced to 10 or 11 Gm. The flask is stoppered and kept in a cool place for several hours. Then the liquid is carefully poured off, the crystals washed with a little petroleum-ether, dried on a water-bath and weighed.

In replying to this criticism, Heyl * states that he was familiar with the Rusting-Smeets' method but that he, nevertheless, adopted the method of Linde.

The alkaloidal strength of hydrastis has been taken up by the A. Ph. A. Committee on Drug Adulteration, † also by the A. Ph. A. Committee on the U. S. Pharmacopœia. ‡

Hyoscyamus. See Belladonna.

Ipecac. H. M. Gordin § directs 5 Gm. ipecac, No. 60 powder, to be shaken for one hour with 2.5 Cc. 10 per cent. sodium carbonate solution and 25 Cc. of ether-chloroform (ether, 3 volumes and chloroform, 1 volume) and then percolated to exhaustion with chloroform-ether. The percolate is shaken out with very dilute sulphuric acid, sodium hydroxide added in excess and the liquid extracted with ether-chloroform. The assay is then finished as directed above for aconite root.

A. B. Lyons § believes that the valuation of the fluidextract of ipecac should be based on titration with Mayer's reagent.

Reports on the alkaloid content of ipecac are made by the A. Ph. A. Committee on Drug Adulteration ¶ and also by the A. Ph. A. Committee on the U. S. Pharmacopœia. **

Nux Vomica. While J. M. Francis †† considers the method of the U. S. P. VIII a poor substitute for the one abolished, he believes the process of determining strychnine by oxidation was tried out and condemned years ago. On the other hand E. H. Farr and R. Wright ‡‡ have experimented with the method and conclude that the process, if worked carefully, gives accurate results. The details which they propose differ from the directions of the Pharmacopœia in that the sulphuric acid solution of the alkaloids is raised to a temperature of 50° C. before the nitric acid is

* Apoth. Ztg., 1906, vol. 21, p. 1060.

† Proc. A. Ph. A., 1906, vol. 54, p. 338.

‡ Proc. A. Ph. A., 1906, vol. 54, p. 439.

§ Proc. A. Ph. A., 1906, vol. 54, p. 379.

§ Proc. A. Ph. A., 1906, vol. 54, p. 440.

¶ Proc. A. Ph. A., 1906, vol. 54, p. 339.

** Proc. A. Ph. A., 1906, vol. 54, p. 440.

†† Proc. A. Ph. A., 1906, vol. 54, p. 453.

‡‡ Pharm. J., 1906, vol. 77, p. 83.

added. H. M. Webster and R. C. Pursel* have also studied the method. They record their own experiments as well as those of others to show that the process is exceedingly liable to give variable results. In one series of experiments they show that, if the nitric acid mixture is allowed to trickle down the side of the beaker containing a solution of brucine in sulphuric acid so as to have a separate layer at the bottom, then at the end of 30 seconds this layer becomes pink, then gradually red, and if the mixture at the end of two minutes is rotated a bright red solution results, giving no reactions for alkaloids at the end of ten minutes. If, on the other hand, the brucine solution is rotated while adding the nitric acid, then a water white mixture results which, at the end of 24 hours, has only a faint yellow tinge and still contains 91 per cent. of the brucine. If the nitric acid is added in a haphazard manner, and the beaker rotated as directed in the official method, then exceedingly variable results are obtained. From further experiments they finally conclude that the success of the method depends on the presence or the formation of lower oxides of nitrogen in the nitric acid. As the result of their experiments they propose the following modification of the U. S. P. text: "Dissolve the alkaloidal residue in 15 Cc. of 3 per cent. sulphuric acid. To this solution add 3 Cc. of the mixture of equal volumes of nitric acid, specific gravity 1.4, and distilled water, then add 1 Cc. of a 5 per cent. solution of sodium nitrite in water and after rotating the liquid a few times set it aside for exactly 30 minutes, stirring it gently three times during this interval." The solution is then made alkaline in the usual way.

G. Fromme† notes that in the available literature no reference is made to the difference between volumetric and gravimetric valuations of nux vomica. Thus, one and the same specimen of nux vomica showed 3.80 per cent. by titration according to the method of the German Pharmacopœia (according to which the alkaloid is extracted by digestion with the drug by ether, chloroform and sodium hydroxide solution, and after decanting the ethereal solution and reducing it to one-half by distillation, agitating the ethereal solution with the stated volume of one-tenth normal hydrochloric acid and determining the excess of acid used), the method of Keller, when the alkaloidal residue was weighed, indicated 3.39 per cent. while it indicated 2.71 per cent. when the residue was titrated. A large number of experiments are recorded which were made in an attempt to learn the cause of these wide variations in the results. The experiments show that the method of the German Pharmacopœia, even with modifications, gives excessive results, and that these high results are due to the fact that in the digestion of the drug with chloroform, ether and sodium hydroxide, soap is produced, carried over into the ethereal solu-

* Am. Drug. 1906, vol. 49, p. 362.

† Geschäftsbericht, Cæsar & Loretz, 1906, p. 58.

tion and determined as alkaloid. The gravimetric estimation, based on the Keller method, gives higher results than if this alkaloidal residue is titrated because of the introduction of impurities. Low results, which at times are obtained, are due to the partial decomposition of the alkaloids when they are dried at a high temperature. Experiments were made to remove all fat from the drug prior to the assay so as to avoid the error introduced through the formation of soap. The complete removal of fats, however, is so difficult that it is not feasible. Another source of error is due to the solubility of brucine chloride in chloroform. Fromme believes that for the determination of total alkaloids in *nux vomica* the drug, without previous removal of fat, should be extracted with a mixture of chloroform and ether and ammonium, not sodium, hydroxide, and that the ethereal solution so obtained should be distilled to dryness at a low temperature, the residue dissolved in chloroform, treated with ether, water, iodeosin and titrated, or else it should be extracted with dilute acid and the alkaloids, after making alkaline, extracted from this with chloroform, and determined gravimetrically.

The official standard for *nux vomica* is discussed by the A. Ph. A. Committee on Drug Adulteration* and also the A. Ph. A. Committee on U. S. Pharmacopœia†. E. H. Farr and R. Wright‡ discuss the alkaloidal content of *nux vomica* and extract of *nux vomica*, especially as to the relative amounts of strychnine and brucine. Since brucine is not inert, but possesses properties similar to those of strychnine, though weaker, they believe that the brucine content should not be neglected, but instead, should be calculated in terms of strychnine and the strychnine standard established on this dual basis.

Opium. A most valuable work in the estimation of alkaloids is done by a sub-committee under the direction of the Association of Official Agricultural Chemists, with L. F. Kebler as referee. At the twenty-second annual convention of this Association (Bulletin No. 99, U. S. Department of Agriculture Bureau of Chemistry, page 61) co-operative work on the assay of opium was reported. A specimen of powdered opium was sent to chemists who offered to co-operate, with directions to assay it by the method of the U. S. P., eighth revision, with additions; by the U. S. P. method as modified by Lamar; by the U. S. P. method as modified by Dohme, and by the Stevens method. The results cannot well be abstracted, but should do a great deal towards putting the assay of opium on a more scientific basis. As a result of the work the referee recommended "that the method recognized by the present Pharmacopœia, eighth revision, for the assaying of opium be adopted as a provisional method by the Association of Official Agricultural Chemists."

* Proc. A. Ph. A. 1906, vol. 54, p. 340.

† Proc. A. Ph. A. 1906, vol. 54, p. 440.

‡ Pharm. J. 1906, vol. 77, p. 84.

The official method of estimating morphine in opium has been criticised by A. B. Lyons.* Especially pertinent is the need of precaution to prevent the absorption of carbon dioxide from the air in determining the solubility of the morphine in lime water. Dr. Lyons notes that he has used with much satisfaction the liquor calcis saccharatus of the British Pharmacopœia in place of lime water. P. Ascher† proposes several modifications of the method of A. B. Stevens. Having found that the opium contains salts of ammonium, he made experiments from which he concluded that this interferes with the estimation of morphine in that the complete solution of morphine by the treatment with lime is prevented. He therefore directs that to expel ammonium the opium be treated with a solution of potassium hydroxide and then evaporated to dryness prior to the solution of the morphine by calcium hydroxide and water. Besides recommending other minor changes, he gives his experience with the official hematoxylin solution. Instead of recommending the use of an old solution he prefers a solution prepared by boiling for some time a little hematoxylin dissolved in water.

A comparison of the results obtained in the valuation of tincture of opium, when estimated according to the methods of the 7th and 3th revisions of the U. S. Pharmacopœia, has been made by T. E. Wetterstroem.‡ G. Bernström§ finds that while continuous shaking facilitates the separation of morphine the separation is not complete at the end of 10 minutes, and that even after 24 hours further separation of morphine takes place. To obtain concordant results, a definite time must be set for the separation of morphine. If the time allowed is too great, separation of calcium meconate is liable to give excessive results. He considers the substitution of ethyl acetate as advantageous, but cautions against the use of water saturated with it. While it has been claimed that the presence of narcotine does not interfere with the titration of morphine when iodeosin is used as indicator, Bernström finds that in the presence of narcotine high titration results are obtained because the indicator is not entirely indifferent to it. G. Fromme|| reviews the work of Bernström and criticises some of his conclusions. Fromme does not agree to the recommendation that 24 hours should be permitted for the complete separation of morphine, nor to the recommendation to accept the volumetric estimation and use the gravimetric determination as a control only. As one source of difference between these two estimations, he notes that morphine is rendered anhydrous only by long-continued drying at 100° C.

* Proc. A. Ph. A. 1906, vol. 54, pp. 441 and 445.

† Am. J. Pharm. 1906, vol. 78, p. 262.

‡ Proc. A. Ph. A., 1906, vol. 54, p. 431.

§ Svensk Farm. Tidskr., 1905, No. 19 and 20 from Pharm. Centrbl., 1906, vol. 47, p. 632.

|| Geschäfts-Bericht, Caesar & Loretz, 1906, p. 48.

H. M. Gordin* has studied the separation of morphine from solutions containing glycerin. After trying various methods, he adopts a method based on the precipitation of morphine by iodine solution, decomposition of the morphine periodide by sulphurous acid and precipitation of the free alkaloid by potassium carbonate.

Georges and Gascard† base a colorimetric determination of morphine on the tint produced in a neutral or very faintly acid solution of morphine by iodic acid with subsequent addition of ammonia. For comparison, a standard solution of morphine hydrochloride is used. C. Mai and C. Rath‡ recount their experiments in the colorimetric estimation of small quantities of morphine by the use of iodic acid, Froehde's reagent, and formaldehyde-sulphuric acid. They give preference to the latter reagent.

Physostigma. Having found the pharmacopœial assay method for extract of physostigma to be rather complicated, H. M. Gordin§ has devised two methods which are recommended because they are expeditious.

Pilocarpus. For the valuation of fluidextract of pilocarpus, H. M. Gordin|| directs the fluidextract to be rendered strongly alkaline and then extracted in a specially constructed separator "No. 1" (see Apparatus) with a mixture of three volumes of ether and one volume chloroform. The ether-chloroform solution contained in separator "No. 2" is concentrated to expel any ammonia present, diluted with ether and extracted with standard acid. The excess of acid is titrated in the usual way.

The alkaloidal strength of pilocarpus has been discussed by C. E. Caspari,¶ the A. Ph. A. Committee on Drug Adulteration** and the A. Ph. A. Committee on U. S. Pharmacopœia.†† While Caspari found eight out of ten specimens to contain less than .2 per cent. of alkaloids, the report of Francis and others would indicate that a drug of the official standard is readily obtained. A. B. Lyons correctly comments that "there is pilocarpus and pilocarpus."

Stramonium. See Belladonna.

Veratrum. G. Bredemann ‡‡ has published an exhaustive investigation on the estimation of alkaloids in veratrum album, and proposes the following method: 12 Gm. powdered drug are rotated with 120 Cc. of a mix-

* Proc. A. Ph. A., 1906, vol. 54, p. 374.

† J. Pharm. Chim. 1906, vol. 23, p. 513.

‡ Arch. der Pharm. 1906, vol. 244, p. 300.

§ Proc. A. Ph. A. 1906, vol. 54, p. 381.

|| Proc. A. Ph. A. 1906, vol. 54, p. 380.

¶ Proc. Mo. Pharm. Assn. 1906, p. 104.

** Proc. A. Ph. A. 1906, vol. 54, p. 338.

†† Proc. A. Ph. A. 1906, vol. 54, p. 440.

‡‡ Apoth. Ztg., 1906, vol. 21, p. 41, 53.

ture of equal parts of chloroform and ether, then 10 Cc. sodium hydroxide solution is added and the mixture shaken frequently during three hours; then sufficient water is added to cause coherence of the drug. The ether-chloroform solution, always more or less turbid, is decanted as completely as possible, shaken with magnesium oxide and three or four drops of water, and then the liquid poured through a dry filter and 100 Cc. of the transparent filtrate corresponding to 10 Gm. drug collected. The chloroform-ether solution is extracted three times with 20 Cc. of water containing acetic acid. The united acetic acid extractions are made alkaline with sodium hydroxide and extracted three times with a mixture of equal parts of chloroform and ether. The ether-chloroform solution is driven off, the alkaloidal residue dried at 100° C. and weighed. For the estimation of alkaloid in the tincture it is proposed that 100 Gm. tincture be concentrated to one-half its volume on a water-bath. Then 1 Gm. paraffin and about 25 Cc. water are added, and the liquid warmed until all alcohol has been expelled. To the warm liquid 2 Gm. acetic acid are added and the liquid allowed to cool with frequent stirring. It is then filtered into a separator through a small wet filter. The paraffin and oil which remain on the filter are heated on a water-bath with 20 Cc. water and 1 Gm. acetic acid until the paraffin melts. The liquid is then allowed to cool, passed through the filter first used, and the dish and filter washed thoroughly with water. The united filtrates are made alkaline with sodium hydroxide and extracted with 20, 10 and 10 Cc. chloroform. Besides estimating the alkaloids gravimetrically the author also attempted to work out a volumetric estimation. Since the drug has been shown to contain 4 alkaloids he proposes that the average molecular weight of these be taken for the calculation of the Cc. equivalent. The correctness of this the author believes to have demonstrated by preparing the pure alkaloids and determining their neutralization equivalent. The alkaloidal content of the specimens of the drug which were examined varied from .199 to .933 per cent.

The Chair called for two papers by Mr. Oldberg, as coming first on the program for this session, one on "Atomic Values," and the other on the "Classification of Inorganic Compounds." He said Mr. Oldberg would not attempt to read his papers in full, but would give an extemporaneous talk covering their substance. Mr. Oldberg thereupon proceeded, first, with a verbal abstract of his paper on "Atomic Values," using by way of illustration a large chart, with a table of elements according to the periodic system. The full text of the papers here follows:

THE IMPORTANCE OF A TRUE CONCEPTION AND EXPRESSION OF
ATOMIC COMBINING VALUES.

BY OSCAR OLDBERG.

Valence and the interatomic linking deducible from it constitute the chief means by which we are able to understand the structure of molecules. Progress in organic chemistry would be impossible without their aid in the absence of better means so far undiscovered. Our absolute dependence upon valence for the solution of many important chemical problems justifies any rational effort to discover its full meaning.

The object of this paper is to present some observations which seem to indicate that the commonly accepted conception and definitions of valence are inadequate, and to submit for consideration what seems to me to be a more helpful view of it. To do this in such a way as to render the subject clear to the large number of chemists, students and teachers, who, like myself, are dependent upon others for new facts brought out by original experimental investigation and upon recognized standard text-books for chemical theories or explanations, I can not avoid recounting a number of familiar statements for purposes of comparison or comment.

VALENCE AS A PERIODIC FUNCTION OF ATOMIC MASS.

Any table of the chemical elements arranged according to the law of periodicity might serve as a basis for this paper, but the table here presented emphasizes some of the points referred to rather better than any other. A new form of periodic table requires justification, which I trust will be found in the following notes:

Since the discovery of the elements placed in the eighth column of this table the "two short periods," each consisting of seven elements (the first "short period" or series including the elements Li to F, and the second including Na to Cl) have become periods of eight instead of seven. But the chief lesson of the "periodic law" is obscured by dividing the most strikingly consistent natural families of the elements for the sake of imparting a rigidly symmetric appearance to the table instead of keeping the families intact. Lithium and sodium admittedly belong to the family of the alkali metals rather than with Cu, Ag and Au. Beryllium and magnesium should be placed with the calcium group rather than with Zn, Cd and Hg. Fluorine and chlorine belong with the other halogens, Br and I, and not in the same family with Mn. Oxygen and sulphur should not be separated from Se and Te.

The so-called "typical elements" are massed in the central upper part of this table.

The atomic volumes (the numbers below the atomic weights) are greatest in the center and least at both ends, and the chemically sluggish heavy metals with high atomic weights are at the ends and bottom of the table.

The elements He, Ne, Ar, Kr and X form a natural family occupying the center of the table. In view of the fact that the properties of any element are intermediate between those of its neighbors in the periodic system the chemically indifferent elements constituting the eighth group should fall between the intensely energetic and pronouncedly "negative elements" (the halogens) and the intensely energetic and pronouncedly "positive" alkali metals.

All of the chemically non-metallic elements (symbols in gothic type) except hydrogen alone (assuming that hydrogen is really a non-metallic element) are contiguous in this table.

Eight natural groups or families are brought into view by the periodic system of classification, the maximum valences of these several groups being, respectively, 1, 2, 3, 4, 5, 6, 7, 8, in regular order. These valences are the maximum "oxygen valences" and in this table they are indicated as plus values.

Four natural groups of chemically non-metallic elements constitute a conspicuous part of the table. All the elements belonging to those four families form binary compounds with hydrogen and from those compounds we know the hydrogen valences of those elements. These hydrogen valences are indicated as minus values.

The hydrogen valences of the elements included in the four groups headed by C, N, O and F, are -4 , -3 , -2 and -1 , while the maximum oxygen valences exhibited by the same groups of elements are $+4$, $+5$, $+6$ and $+7$. It will be seen that the difference between the hydrogen valence and the maximum oxygen valence is in each group 8 units.

The non-metallic elements of the 4th, 5th, 6th and 7th groups form not only binary compounds with hydrogen, but also, with but two exceptions (oxygen and fluorine), acidic hydroxides and their oxygen salts. These hydrogen compounds and oxygen compounds of the non-metallic elements are the foundation-stones upon which our conceptions of valence rest. I find that whenever any two of these non-metallic elements enter into combination with each other in such a way that each atom of one is directly combined with each atom of the other, then, of the two elements so immediately united, an element which stands to the right in any series of the table has the same atomic combining value whenever it is in combination with any element to its left; and an element which stands higher in any group of that table, has the same combining value whenever it is in combination with any element below it. These constant valences are hydrogen valences.

THE COMMONLY ACCEPTED CONCEPTION OF VALENCE.

Valence as commonly understood, is expressed by a number assumed to refer to the specific combining power or value of the hydrogen atom as the unit. The valence of any other atom is generally described as "the number of hydrogen atoms which it can hold in combination with itself or

which it can replace in any compound." But 1, less than one-fourth of the elements combine directly with hydrogen; 2, apparently no single atom of any kind can hold more than four hydrogen atoms, which limits the valence directly measurable by hydrogen to four units, whereas the admitted valence of a large number of elements may exceed four; and 3, the number of hydrogen atoms which any other atom can "replace" in any given molecule does not decide the question of its valence in molecules in which it cannot be said to replace hydrogen. Elements with valences above 4 form compounds in which they neither combine with nor replace hydrogen.

POTENTIAL VALENCE AND ACTUAL VALENCE.

We can know the valence of any element only when it is in actual combination. The same element may exhibit different valences in different compounds. Whenever the valence of any given element has been found to be the same in all of its known compounds, we may and do make good use of that knowledge; the potential valence of the free element is then held to be identical with its actual valence when in combination. But a free or uncombined element has no actual valence, or a valence expressed by 0. The potential valence of a free oxygen atom is 2, but its actual valence is 0; the actual valence of oxygen becomes 2 only when it ceases to be uncombined oxygen. The maximum potential valence of a carbon atom may be regarded as 4; but by combustion it may form either CO or CO₂, or both, according to circumstances.

BONDS.

It is very convenient and helpful to designate the unit of valence by the term "bond." We, therefore, speak of the carbon bonds, the nitrogen bonds, and the bonds of other atoms, in organic chemistry. There is little danger, if any, that erroneous notions may result from the use of the term, and from the general practice of representing bonds by lines, when we assume that free elements have no bonds, and that the arithmetical number of the bonds of an atom in combination depends upon its position and connections, and may differ from their algebraic sum. Whatever is permissible and useful in the chemistry of carbon compounds is equally permissible and useful in all chemistry.

MOLECULES HAVE NO FREE BONDS.

Valence means nothing unless it means that whenever any two atoms are in direct combination with each other in any molecule, elemental or compound, simple or complex, they must be held to each other by the same number of bonds from each atom. It means nothing unless it means that all of the bonds of each and all of the constituent atoms of the molecules are utilized in actual combination (or "tied") so that no atom in any molecule possesses any free bond. Therefore, a molecule has no

valence, or its valence is the sum of 0. All the constituent atoms of any molecule must together have an even number of bonds. One-half those bonds are the combining units of "positive elements" and the other half the combining units of "negative elements."

Free or disconnected bonds are conceivable only as possessed by electrolytically disconnected ions, and the free ions can not be removed from the solutions containing them.

HYDROGEN VALENCES.

The capacity of any single atom to hold hydrogen alone in combination with itself is its "hydrogen valence." It is a significant fact that the hydrogen valence of any given element is a fixed number, or that, in other words, no element has more than one hydrogen valence. Another and equally significant fact is that the actual valence of any wholly negative element in any compound is its hydrogen valence. The hydrogen standard for the measurement of valence has therefore a specific value notwithstanding its limited range.

The hydrogen valence of carbon and silicon is invariably 4; that of any element of the nitrogen group is invariably 3; that of oxygen and the sulphur family is 2; and that of the halogens 1.

Hydrogen valences are conclusively established by the structure of strictly binary compounds in which each atom of one element is directly united to each atom of the other and in which each atom of either of the component elements has the same algebraic combining number as any other atom of the same element. Neither hydrogen valence nor oxygen valence is determined from compounds containing two or more atoms of the same element connected immediately to each other, as, for instance from NH_3 , $\text{H}_2\text{N.NH}_2$, HOOH , or from compounds containing carbon chains. That the hydrogen valence of any element must be exhibited by the compound which a *single atom* of that element forms with hydrogen alone is evident from the fact that the valence of H is 1.

OXYGEN VALENCES.

The capacity of any given element to hold oxygen in combination with itself is its "oxygen valence."

Nearly all elements combine directly with oxygen. Atomic valence, as commonly understood, is accordingly much more frequently measured by the oxygen standard than by hydrogen.

Oxygen valences range from 1 to 8, and many elements combine with oxygen in more than one proportion or have more than one oxygen valence. Nitrogen has five different oxygen valences, as assumed from the compounds N_2O , NO , N_2O_3 , NO_2 , and N_2O_5 . But normal or ruling oxygen valences are established by the structure of acids, bases and salts rather than by the composition of oxides. The normal oxygen valences of N are 1, 3 and 5.

HYDROGEN VALENCES AND OXYGEN VALENCES ARE NOT IDENTICAL OR INTER-CHANGEABLE BUT COMPLEMENTARY.

Hydrogen valences and oxygen valences are intimately related, and may be expressed arithmetically by identical numbers, as is commonly done; but they are widely different in their significance as well as in their range. The hydrogen valence of oxygen is 2, and the oxygen valence of hydrogen is 1. But the true atomic combining value of oxygen should be expressed as -2 , and that of hydrogen as $+1$.

When four oxygen atoms are directly combined by all of their valence with any one other atom, this atom cannot at the same time hold any third element in combination. But, if four oxygen atoms are contained in the molecule of any hydroxyl acid of a non-metallic element containing no hydrogen except that of the hydroxyl, it is evident that the number of hydrogen atoms in that molecule must be that expressed by the hydrogen valence of the acidic element,* and no other number, because the hydrogen atoms as well as the acidic atom must be in direct combination with the oxygen. This is shown in the following table:

Hydrogen compounds.	Hydroxyl acids.	Hydrogen valence of the element.	Oxygen valence of the element.	Sum of the two valences.
HCl	HClO ₄	1	7	8
HI	HIO ₄	1	7	8
H ₂ S	H ₂ SO ₄	2	6	8
H ₂ Se	H ₂ SeO ₄	2	6	8
H ₂ Te	H ₂ TeO ₄	2	6	8
H ₃ N	H ₃ NO ₄	3	5	8
H ₃ P	H ₃ PO ₄	3	5	8
H ₃ As	H ₃ AsO ₄	3	5	8
H ₃ Sb	H ₃ SbO ₄	3	5	8
H ₄ C	H ₄ CO ₄	4	4	8
H ₄ Si	H ₄ SiO ₄	4	4	8

Salts of all these hydroxyl acids are known. The valence of the acidic element in each acid is its maximum oxygen valence.

From these comparisons it is evident that the oxygen valences of the elements are limited by their hydrogen valences and *vice versa*. An element which does not combine with hydrogen and has no hydrogen valence may have an oxygen valence as high as 8. Any element which in any of its compounds has a valence of 8 can never be a negative element. A hydrogen valence of 1 limits the highest possible oxygen valence to 7; a hydrogen valence of 2 makes the highest possible oxygen valence 6; an element having a hydrogen valence of 3 can never attain a higher valence than 5; and when the hydrogen valence is 4 the oxygen valence cannot exceed 4.

As valence is commonly expressed, we say that the highest valence ex-

* By the acidic element is meant the element combined with the hydroxyl.

hibited by carbon is 4 and its lowest valence 2, showing a difference of two units; the highest valence of nitrogen is 5 and the lowest 1, a difference of four units; the highest valence of sulphur is 6 and the lowest 2, again a difference of four units; the highest valence of chlorine is 7 and the lowest 1, a difference of six units. But if the numbers expressing hydrogen valence be treated as minus values and those expressing oxygen valence as plus values, we shall then find that the difference between the highest and the lowest combining values are invariably eight units in the cases of C, Si, N, P, As, Sb, S, Se, Te, Cl, Br and I. Oxygen and fluorine have no oxygen valences.

Apparently, then, the hydrogen standard and the oxygen standard are not identical or interchangeable but complementary. The combining value of C would then have a range of from -4 to $+4$; the range of combining value of N would be from -3 to $+5$; that of S from -2 to $+6$, and that of Cl from -1 to $+7$.

Comparisons of the known combining values of representative non-metallic elements as commonly expressed (without the use of plus and minus signs) and as expressed algebraically are shown in the following table of compounds formed by oxygen or hydrogen, or both, with a third element:

Compounds.	Valence of the third element.	
	As commonly expressed (bonds added arithmetically.)	Sums of positive and negative bonds counted algebraically.
H ₂ CO ₃	4	+4
HCOOH	2	+2
CO.....	2	+2
H ₂ CO	0	0
H ₂ COH	2	-2
H ₄ C.....	4	-4
HNO ₃	5	+5
HNO ₂	3	+3
HNO	1	+1
N	0	0
H ₂ N	3	-3
H ₄ NOH	5	-3
H ₂ PO ₃	5	+5
H ₂ PHO ₃	5	+3
H ₂ PH ₂ O ₃	5	+1
P	0	0
H ₃ P	3	-3
H ₂ SO ₄	6	+6
H ₂ SO ₃	4	+4
H ₂ SO ₂	2	+2
S	0	0
H ₂ S	2	-2
HClO ₄	7	+7
HClO ₃	5	+5
HClO ₂	3	+3
HClO	1	+1
Cl.....	0	0
HCl	1	-1

HYDROGEN AND OXYGEN ARE OF RELATIVELY OPPOSITE CHEMICAL QUALITIES.

Hydrogen is a "positive element" as compared with all other non-metallic elements. Oxygen is a negative element as compared with all other elements, metallic and non-metallic.

In the chemistry of the carbon compounds *oxidation* may mean either combination with oxygen or the removal of hydrogen; and by *reduction* is meant "the opposite of oxidation"—either the splitting off of oxygen or the addition of hydrogen.

The pronouncedly positive elements decompose water by entering into immediate combination with its negative element, the oxygen; the pronouncedly negative elements called halogens decompose water by entering into combination with its positive element, the hydrogen.

Carbon and nitrogen form basic atomic groups or radicals with hydrogen, but acidic groups or radicals with oxygen.

The groups CH_3 , C_2H_5 , C_6H_5 , C_3H_7 , and other hydrocarbon radicals form alcohols analogous to the inorganic basic hydroxides and perform basic functions in the formation of esters. But the carbonyl group, CO , is an essential characteristic group which in combination with hydroxyl is contained in every organic acid. The carbonyl is as necessary to an organic acid as is the acidic element to an inorganic acid. (It should not be overlooked, however, that the carboxyl is united to one of the atoms of the remainder of the molecule by a "negative carbon bond." This carbon bond of the carboxyl is nearly always united to another carbon atom; KO.CO.OH is *not* an acid.)

It is evidently not the C alone that imparts to C_2H_5 the power of performing the basic function in the formation of esters, nor is it the C alone that gives to carboxyl the distinguishing character of imparting the acid properties to the organic acids.

Carbon is necessary to the general properties of H_3COH as well as to $(\text{HO})_2\text{CO}$ and $\text{H}_3\text{C.CO.OH}$; but it is evident that radically different properties are possessed by atomic groups composed of C united to H and atomic groups composed of C united to O. The carbon united to H is negative while that united to O is positive carbon.

The compound H_3N has decidedly alkaline properties; but the oxides of nitrogen are acidic. The statement that the acid character of nitric acid is due to its nitrogen simply means that nitrogen, like all other non-metallic elements forming hydroxides, is of such a nature that its hydroxides are acidic. The acid properties of HONO_2 are due not to the N *alone*, but also to the fact that this N is in immediate combination with hydroxyl. The basic properties of H_4NOH are due not to the N *alone*, but also to the H with which that N is in immediate combination. But the N of the HONO_2 and that of the H_4NOH are quite different from each other, for N is negative toward hydrogen but positive toward oxygen.

POSITIVE AND NEGATIVE ELEMENTS.

The employment of the terms "positive" and "negative" in connection with the chemical elements and with ions and radicals is well-nigh universal. They are convenient terms used to express certain recognized general properties. Their use has been objected to partly because their meaning has not been well defined and partly because of the absence of any uniform and readily applicable rule by which positive elements and negative elements may be distinguished from each other in molecules. I believe that I have found such a rule based upon the law of periodicity, and that atomic combining value can not be fully expressed without recognizing the difference between the combining power of positive atoms and that of negative atoms.*

The difference between the Cl of chlorides and the Cl of chlorates is due to the fact that the former is negative and the latter positive chlorine. When hydrogen and chlorine combine with each other H is the positive and Cl the negative element. To this statement the objection is raised that the hydrogen atoms of hydrocarbons can be replaced by chlorine which fact is declared to be sufficient proof that H and Cl are mutually interchangeable and therefore can not be of opposite qualities. But positive elements and negative elements often replace each other. When, however, a positive element is replaced by a negative one, or the reverse, the new compound differs radically from the original in its general character. The hydrocarbons differ decidedly from their halogen derivatives.

If positive elements and negative elements are recognized at all then zinc is positive. Iodine is the negative element in every iodide. But Zn and I can both enter into combination with C and can replace each other. Zinc is combined with the carbon atoms in $\text{Zn}(\text{H}_3\text{C})_2$, and this compound is produced by the action of the metal on methyl iodide.

When the hydrogen of an organic compound is replaced by Cl or any other element it makes a difference which atomic group in the molecule is changed by the substitution. Trichloroacetic acid is referred to as an instance in which hydrogen atoms are replaced by chlorine without causing any radical change in the general character of the compound; but $\text{H}_3\text{C}.\text{CO}.\text{OH}$ and $\text{Cl}_3\text{C}.\text{CO}.\text{OH}$ are both acids because they both contain $\text{CO}.\text{OH}$ held by a carbon bond.

The terms "positive" and "negative," as applied to the chemical elements are relative. While chlorine is a positive element when in combination with oxygen, it is a negative element when in combination with any other element with which it is known to form any compound.

Iodine is a positive element when in combination with bromine, chlorine, fluorine or oxygen, but a negative element in all other compounds. Sulphur is positive when in combination with oxygen or with a halogen, but

* R. Abegg expresses the same view in *Z. anorg. Chem.*, 39, 330-380, 1904.

negative when in relation to all other elements. Positive and negative elements may be distinguished from each other with the aid of the law of periodicity, independently of all other considerations, that is, according to their relative positions in the table of elements arranged according to the periodic system.

Just as we know the valence of any atom only when it is in actual combination, we may recognize the non-metallic elements in the fourth, fifth, sixth and seventh groups of the periodic table as positive or negative only by their connections in molecules.

All metals are positive elements. All elements when in immediate combination with metals are negative elements. Hydrogen is a positive element whenever combined with any other non-metallic element. Oxygen and fluorine are invariably negative elements in the compounds they form with any other elements.

The chemical quality or character (polarity) of the elements

Cl, Br, I, S, Se, Te, N, P, As, Sb, C and Si

is determined by their connections. As placed in the above line any element to the left is a negative element whenever it is combined with any element to the right. It will be seen that the order in which these twelve non-metallic elements are here placed is governed by their relative positions in the periodic system; in other words, by their relative atomic weights. In the periodic table they are arranged as follows:

C	N	(	O	F)
Si	P		S	Cl	
	As		Se	Br	
	Sb		Te	I	

They are positive or negative in their relations to each other according to this rule:

Of the non-metallic elements in the table arranged according to the law of periodicity any element to the left is a positive element in its relation to any element to the right, and any element below is a positive element in its relation to any element above it.

Of any two elements in the same "period" that which has a smaller atomic mass is the positive element when the two are in immediate combination. Of any two elements belonging to the same "group" that which has the greater atomic mass is the positive element when the two are immediately combined.

Of any two atoms in immediate combination one is to be regarded as relatively positive and the other as relatively negative. The bonds by which positive atoms are united to negative atoms may be called positive

bonds, and each designated as $+1$. The bonds by which negative atoms are united to positive atoms may be called negative bonds, and each designated as -1 . The algebraic sum of the bonds by which any two atoms are united is then zero. It follows that when the algebraic sums of the positive and negative bonds of all atoms are taken as their true combining values any increase in the combining value of any atom or atoms concerned in any chemical reaction must be exactly offset by a diminution in the combining value of one or more other atoms, the gain and the loss balancing each other unit for unit, *a fact which may in every case be readily seen by this method of expressing atomic combining value, but which is not discoverable from the valences as commonly understood and expressed.*

The combining value of any negative element in combination exclusively with one or more relatively positive elements is invariably its hydrogen valence.

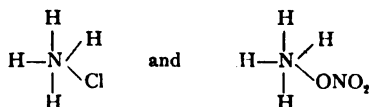
The combining values of positive elements are their oxygen valences.

The nomenclature of binary compounds harmonizes with the recognition of positive and negative elements so far as it is consistently applied. We can have oxides of sulphur but no sulphide of oxygen. We can have chlorides, bromides and iodides of sulphur but no sulphide of chlorine, bromine or iodine. We can have chloride of bromine but no bromide of chlorine. Iodine, exercising its oxygen valences, may combine with either Br, Cl or F, having a combining value of -1 , but we can have no iodide of bromine, chlorine or fluorine. There cannot be more than one iodine atom in any compound formed by that element with either Br, Cl or F. In CaS the combining value of the positive element, Ca, is $+2$ and that of the negative element, S, is -2 . But we may have two negative elements mediately linked to each other by a positive element, as in ONCl, in which the combining value of the N is $+3$, that of the O is -2 , and that of the Cl -1 . Or we may have two positive elements mediately linked to each other by a negative element, as in potassium isocyanide, KNC, in which the algebraic combining number of the N is -3 , while that of the K is $+1$, and that of the C is $+2$. That the C in KNC can have but two bonds may be assumed from the fact that the lowest possible algebraic combining value of N must be -3 , because its maximum combining value is $+5$ and the difference between the extremes of the algebraic combining numbers of any element never exceeds 8 units. Further we may have molecules in which the same atom may be in combination with two or more other atoms, one or more of which may be relatively positive and the remainder relatively negative. Carbon is a negative element in relation to K but a positive element in relation to N. Hence the C in KCN must be regarded as having one negative bond holding the K and three positive bonds holding the N, so that its algebraic combining value is $+2$, the sum of -1 and $+3$. The respective algebraic combining values of the atoms are precisely the same in KCN as in KNC, but the "valence" of the C, as valence is commonly understood, is 2 in KNC but 4 in KCN.

In $\text{KNC} \begin{smallmatrix} \text{C}_2\text{H}_5 \\ \text{I} \end{smallmatrix}$ the first carbon atom has four bonds, but its algebraic combining number is still +2, because the bond by which it holds the group C_2H_5 is a negative bond, and that by which it holds the iodine is a positive bond. The carbon bond by which ethyl unites with relatively negative elements and atomic groups is a positive bond; it is a positive bond in $\text{KNC} \begin{smallmatrix} \text{C}_2\text{H}_5 \\ \text{I} \end{smallmatrix}$ and $\text{C}_2\text{H}_5\text{NC}$.

The N in H_3N has three bonds, and its algebraic combining number is -3. In H_4NCl the N has five bonds, but its algebraic combining number is the same as in H_3N , for the nitrogen bonds holding the hydrogen are negative bonds, and the bond holding the chlorine must be a positive bond.

The graphic structural formulas



show that when ammonia forms ammonium chloride with HCl or ammonium nitrate with HONO_2 , the nitrogen atom of the ammonia acquires two additional bonds or units of valence, one positive and the other negative. Its algebraic combining value, however, remains unaltered. This explains why it is that when alkaloids and derivatives of ammonia form salts with the acids no water is formed. There is no sulphuric acid in the sulphate of any alkaloid; the N of the alkaloid separates the hydrogen of the acid from the group SO_4 , just as the N of ammonia does in forming $(\text{H}_4\text{N})_2\text{O}_2\text{SO}_2$, in which we can see there is no $(\text{HO})_2\text{SO}_2$.

The combining value of the C in H_4C must be -4; in CCl_4 it must be +4. But in H_3CCl the algebraic combining number of the C is -2, in H_2CCl_2 it is zero, and in HCCl_3 it is +2. And when these combining numbers are recognized it is easy to explain the reactions by which the chlorine derivatives of methane are formed, on the principle that gain and loss of combining values always offset each other unit for unit.

Phosphoric, phosphorous and hypophosphorous compounds may be distinguished from each other not by the sums of the phosphorus bonds counted arithmetically but by their sums counted algebraically. The P in HOPH_2O has 5 bonds but two of them are to be counted as minus-units because they hold two hydrogen atoms while the other three must be counted as plus-units because united to oxygen; hence the algebraic combining number of that P is +1. The P in $(\text{HO})_2\text{PHO}$ has five bonds counted arithmetically but one of them holds a hydrogen atom, so that the algebraic combining number of this P is +3. The P in any phosphoric acid also has 5 bonds but its algebraic combining number is +5 because it is united by all of its bonds to oxygen.

As the algebraic sum of all the bonds in any molecule must be zero one of the chlorine atoms in the molecule Cl_2 must be considered as having a combining value represented by $+1$ and the other a value of -1 . *

In the molecule O_2 one of the atoms must have a value of $+2$ and the other a value of -2 unless each have a value of 0. The combining value of one of the oxygen atoms in H_2O_2 , and in other peroxides containing two oxygen atoms directly united to each other, must be 0.

The structure of the thio-salts, in which positive sulphur is the acidic element, and in which negative sulphur performs the same functions that are performed by oxygen in the corresponding oxygen salts, can be at once discovered in the light of algebraic expressions of atomic combining value. It is evident at a glance that the molecule commonly written CaS_5 and called "calcium pentasulphide," cannot be a *sulphide*, because Ca has an invariable combining value of $+2$ and the combining value of the sulphur of all sulphides is -2 . It is evident further that the algebraic sum of the combining values of all the five sulphur atoms together must be -2 , because the sum of all the bonds of any molecule must be zero. The compound must, therefore, be calcium tetrathiosulphate, or CaSS_4 corresponding to CaSO_4 . The acidic sulphur atom in it has a value of $+6$, and the other four sulphur atoms, which exercise the functions performed by the oxygen in CaSO_4 , have a value of -2 each. Hence the algebraic sum of the combining values of all the sulphur atoms together is in fact -2 .

In the same manner we can see that K_3S_3 cannot be a sulphide, but must be potassium hypothiosulphite corresponding to K_2SO_3 . The acidic sulphur atom in this compound has an algebraic combining value of $+2$. The two linking sulphur atoms have each a value of -2 . Only one of the sulphur atoms forms copper sulphide when the solution of the K_2SS_2 is precipitated with CuSO_4 , the remaining two atoms falling as free sulphur, for, as the total value of the three atoms of S must be -2 , and one atom forming CuS has that value, it follows that the other two atoms must together have a value of zero.

OXIDATION AND REDUCTION.

There is great diversity of opinion as to what constitutes "oxidation" and what constitutes "reduction." In its narrowest or most literal sense oxidation means combination with oxygen. The formation of MgO by the combustion of the metal, or the formation of CO or of CO_2 from carbon, or of CO_2 from CO , is clearly oxidation; but a satisfactory definition of the term is difficult even when used in that restricted sense. We all agree, however, that in every case of oxidation the element oxidized acquires increased actual combining value.

An increase of the number of oxygen atoms in a molecule, or of the

* See Noyes and Lyon, J. Am. Chem. Soc., 23, 460 (1901), and Stieglitz, *ibidem* 23, 796.

proportion of oxygen in weight, is not oxidation unless it is attended by increased actual combining value of one or more of the component atoms of the molecule. The formation of $(\text{HO})_6\text{S}$ from SO_3 is not oxidation although the percentage of oxygen is only 60 in SO_3 , while it is over 70 in $(\text{HO})_6\text{S}$. It is not oxidation because the combining value of the sulphur atom remains unchanged, and that value remains unchanged because every unit of oxygen valence is offset by a unit of hydrogen valence, each added oxygen atom being accompanied by two added hydrogen atoms.

In its widest sense the term oxidation includes every increase of actual atomic combining value expressed algebraically. Every case of oxidation, as that term is applied in its literal and narrow sense, is also oxidation in its widest sense. In the widest sense of the term there can be no oxidation without corresponding reduction elsewhere, and no reduction without oxidation, for changes of algebraic combining value cannot occur singly. That such must be the case may be seen from the fact that all free elements as well as all molecules are assumed to have no valence or a combining value represented by zero, and that the algebraic sum of any number of bonds by which any two atoms are immediately united to each other must also be zero. It is accordingly clearly understood in a general way as a purely mathematical proposition without reference to chemical laws. But it is significant that in every instance the plus-units and minus-units of atomic combining value can be identified according to the relative positions which the combined atoms occupy in the periodic system. In this light the reactions may be understood not only in a general way but in detail.

The use of the term oxidation to designate changes of combining value in cases where oxygen is not one of the elements involved in the reactions is warranted on the ground that such changes, in their very nature, as described, can not take place without some change in that kind of valence which has been referred to as *oxygen valence*. As hydrogen valence is the valence of any negative element when combined exclusively with one or more positive elements, and is unchangeable, it follows that while we may have a change from one minus value to another in the case of an atom serving as a connecting link between a positive and a negative element (as when carbon atoms intervene between hydrogen and oxygen or between hydrogen and chlorine) such a change must necessarily be attended by an opposite change of oxygen valence elsewhere.

James Walker says in his *Introduction to Physical Chemistry*:

"A change in the quantity of electricity associated with a positive or negative radical is accompanied by an entire change in the properties of the radical. Thus the reactions of diferrion, $\text{Fe}^{\cdot\cdot}$, are entirely different from the reactions of triferriion, $\text{Fe}^{\cdot\cdot\cdot}$; and the reactions of permanganion, the ion of the permanganates, MnO_4^- , differ greatly from the reactions of manganion, the ion of the manganates, MnO_3^- . In connection with such

changes in the electric charges of ions, the student will find it useful to remember that addition of a positive charge or removal of a negative charge corresponds to what is generally known as *oxidation* in solution; and that removal of a positive charge or addition of a negative charge corresponds to *reduction*. Thus we are said to oxidize a ferrous salt to a ferric salt when we convert the ion Fe^{++} into Fe^{+++} , or to reduce a permanganate to a manganate when we convert the ion MnO_4' into the ion MnO_4'' . In the first instance a positive charge is removed; in the second a negative charge."

The combining values of atoms, as expressed algebraically, may change from zero to a plus or minus value; from a plus or minus value to zero, or from a lower to a higher plus value or *vice versa*. All of these changes may be seen in the reactions here cited, and it will be seen that in each case the loss and gain offset each other unit for unit.

When a metal forms an oxide by combustion its combining value rises from zero to a plus value, and that of the oxygen falls from zero to a minus value.

When a metal is dissolved in an acid and forms a salt, its combining value rises from zero to a plus value, while the replaced hydrogen of the acid falls from a plus value to zero; or, if hydrogen is not liberated, the combining value of the acidic element falls as many units as that of the metal rises. Nitric acid when used as an oxidizing agent is changed to NO if a sufficient amount of reducing agent be present; the nitrogen, therefore, changes its algebraic combining number from +5 to +2, so that its value falls three units. It, therefore, raises the combining value of three atoms of silver from zero to +3, or that of one atom of bismuth from zero to +3; or the nitrogen of five molecules of nitric acid can raise the combining value of three atoms of phosphorus from zero to +5; or the nitrogen of two molecules of nitric acid can raise the combining value of three atoms of zinc from zero to +2. When ferrous chloride is changed to ferric by means of hydrogen chloride and nitric acid one molecule of the acid is required for three molecules of FeCl_2 .

When Cu is dissolved in $(\text{HO})_2\text{SO}_4$ the copper atom changes its combining value from zero to +2 and the S of one molecule of the acid changes its value from +6 to +4. When mercuric chloride in solution is reduced to mercurous chloride by SO_2 one molecule of SO_2 suffices for two molecules of HgCl_2 because the combining value of each mercury atom falls from +2 to +1 while that of the sulphur atom rises from +4 to +6.

One molecule of KClO_3 with six molecules of HCl will give us one molecule of KCl and six atoms of free chlorine, because the chlorine atom of the KClO_3 changes its combining value from +5 to -1, a difference of six units, and the six chlorine atoms of the 6HCl change their value from -1 to zero.

The "valence" of each of the nitrogen atoms in H_2NONO_2 is clearly

5; but when the combining values are expressed algebraically that of the first nitrogen atom is -3 and that of the other is $+5$. When the ammonium nitrate is decomposed by heat into water and N_2O one nitrogen atom changes its algebraic combining number from -3 to $+1$, and the other changes its value from $+5$ to $+1$.

The "valence" of the first nitrogen atom in H_4NONO is 5 and that of the other is 3. The algebraic combining numbers are -3 and $+3$. When the ammonium nitrite is decomposed by heat into water and nitrogen one atom of N changes its value from -3 to zero and the other changes its value from $+3$ to zero.

The algebraic combining number of the carbon atom in CH_4 is evidently -4 . When the hydrogen is replaced by chlorine the combining value of the C is raised two units for each chlorine atom introduced. In order to produce one molecule of monochlormethane two chlorine atoms are required both of which change their combining number from zero to -1 , one of these chlorine atoms producing HCl with the hydrogen atom removed from the methane. The introduction of one negative atom and the removal of one positive hydrogen atom change the combining number of the C from -4 to -2 .

The equation $C_2H_5OH + 2FeCl_3 = C_2H_4O + 2FeCl_2 + 2HCl$ is explained by the fact that the two iron atoms together lose two units of combining value, which are taken up by one of the carbon atoms.

The equation $C_2H_4O + 2FeCl_3 + H_2O = HC_2H_3O_2 + 2FeCl_2 + 2HCl$ is explained in the same manner as the preceding equation.

The equation $2FeI_2 + 3O + H_2O = 2OFeOH + 4I$ shows that the two iron atoms, together with the four iodine atoms, gain together six units of algebraic combining value, while each of the three oxygen atoms changes its value from zero to -2 .

When two molecules of H_2S and one molecule of SO_2 form water and free sulphur, the two sulphur atoms of the $2H_2S$ gain four units, while the S of the SO_2 loses four units.

In the equation $Sb_2S_3 + 9O = Sb_2O_3 + 3SO_2$ each of the sulphur atoms changes its value from -2 to $+4$, or six units; these 18 units are lost by the oxygen.

In the reaction $6KOH + 6I = 5KI + KIO_3 + 3H_2O$ the only element changing its combining value is the iodine; but five of the iodine atoms lose five units and the sixth gains five.

The phosphorus is the only element which changes its algebraic combining number in $3Ca(OH)_2 + 8P + 6H_2O = 3Ca(PH_2O_2)_2 + 2H_3P$. Six atoms of the P gain one unit each, and the remaining two atoms lose those six units.

The "valence" of the sulphur atom in $(HO)_2SO_2$ is 6, and that of the sulphur in H_2S is 2; the difference is 4 units. But the algebraic combining value of the S in the acid is $+6$, and that of the S in the sulphide is

—2; the difference is then seen to be not 4 units but 8. That it is in reality 8 units may be seen from the fact that 24 units of oxidation are required to convert three molecules of H_2S into H_2SO_4 :



The compound H_2O_2 is a powerful oxidizing agent because one-half of its oxygen must have a combining value of zero. This oxygen is easily liberated and when it enters into combination with some other element its combining value changes from zero to —2. The liberation of one-half of the oxygen of H_2O_2 is not reduction because the oxygen set free does not change its algebraic combining number.

In the reaction $5\text{H}_2\text{O}_2 + 2\text{KMnO}_4 + 3\text{H}_2\text{SO}_4 = 2\text{MnSO}_4 + \text{K}_2\text{SO}_4 + 8\text{H}_2\text{O} + 10\text{O}$ each atom of manganese changes its combining value from +7 to +2 losing 5 units; these 10 units liberate all the oxygen from the $5\text{H}_2\text{O}_2$ because one-half of that oxygen already has a combining value of zero and the other half must require just 10 units of oxidation to change it to zero. As potassium permanganate does not "give up oxygen on the addition of an acid" *unless a reducing agent is present* the reduction in this case is performed by one-half of the oxygen of the H_2O_2 which increases its algebraic combining value from —2 to zero. When I first realized the fact that H_2O_2 in this reaction must be regarded as a reducing agent the discovery disturbed me momentarily; but when combined oxygen having an algebraic combining value of —2 is liberated its value rises to zero, and when oxygen having a value of zero enters into combination and changes its value to —2 this change is a reduction of the value of that oxygen.

The combining value of one of the carbon atoms of oxalic acid is +4 and that of the other is +2. In the reaction $5\text{H}_2\text{C}_2\text{O}_4 + 2\text{KMnO}_4 + 3\text{H}_2\text{SO}_4 = \text{K}_2\text{SO}_4 + 2\text{MnSO}_4 + 8\text{H}_2\text{O} + 10\text{CO}_2$ five carbon atoms gain 10 units which are lost by the two manganese atoms. Compare this with the preceding example.

In the reaction $\text{MnSO}_4 + \text{H}_2\text{O}_2 + 2\text{H}_4\text{NOH} = \text{MnO}_2 + (\text{H}_4\text{N})_2\text{SO}_4 + 2\text{H}_2\text{O}$ it may be readily seen that the manganese atom changes its combining value from +2 to +4. The two units gained by it are lost by one of the oxygen atoms of the H_2O_2 . In this case, therefore, the H_2O_2 acts as an oxidizing agent, for one-half of its oxygen changes its real combining value from 0 to —2.

Strictly speaking, oxidizing agents and reducing agents are not molecules but atoms.

The ability to write and balance chemical equations representing complex reactions involving changes of atomic combining value is not easily acquired or imparted by the methods usually employed. The most satisfactory rule is that found in Prescott and Johnson's Qualitative Chemical

Analysis (D. Van Nostrand Co., New York). Otis C. Johnson originated this rule, but did not enter into a sufficient discussion of it to show its basis and full significance. It was rejected because it was not properly understood. Having used this rule for nearly ten years with unfailing satisfaction I became convinced that it involves more than its author disclosed. All who have seen or used Johnson's rule will perceive that the conclusions presented in this paper are mainly the outgrowth of a study of the foundation and bearings of that rule.

In my text-book on Inorganic Chemistry (1900) I adopted the view that the true combining values of atoms can not be fully expressed without reference to polarity, and that the atomic combining values possible to the chemical elements are $-4, -3, -2, -1, 0, +1, +2, +3, +4, +5, +6, +7$ and $+8$. Abegg in his paper in the *Zeitschrift f. anorg. Chemie* (1904), expresses similar views. I also held that to be consistent we must regard any diatomic molecule of an element as being composed of one atom of positive chemical polarity and another of negative polarity. But my view that positive and negative elements can be identified according to their relative positions in the periodic tables is herein published for the first time.

CONCLUSION.

The suggested algebraic method of expression of atomic combining values is not in conflict with our commonly accepted conception of valence, but rather a distinct development of it. It is in harmony with the theory of electrolytic dissociation, the law of periodicity, and our generally accepted chemical nomenclature. Even if it be considered as a mere mathematical device, its utility is so great that it merits general adoption. But the evidence that it is founded upon natural law seems to me convincing.

The theory of ionization teaches that positive ions and negative ions are, respectively, charged with positive and negative electricity. The combining power of positive elements differs as to its *kind* from the combining power of negative elements as positive electricity differs from negative electricity. The energy or power which unites positive and negative ions into chemical compounds must be the same as that which holds together the component atoms of compound ions. The *amount* of the atomic combining power of a positive element is measured by the amount of the atomic combining power of a negative element which it offsets in actual combination. Thus the relative atomic combining power of hydrogen is measured by the relative amount of the combining power of oxygen which it offsets. Conversely, the combining power of a negative element is expressed by its capacity to offset that of a positive element.

The relative amount of the atomic combining power of *negative chlorine* is that required to offset the combining power of one hydrogen atom. The relative amount of the atomic combining power *positive chlorine* is

the amount required to offset the combining power of oxygen by which it is held in combination.

As the plus sign is employed to designate positive electricity and the minus sign to designate negative electricity, and the plus and minus signs, respectively, to distinguish between positive and negative ions, these signs may also be used to distinguish between the two opposite kinds of combining power of positive and negative elements for the free bonds of positive ions are those of positive elements and the free bonds of negative ions are those of negative elements.

I have examined hundreds of equations representing reactions involving changes of atomic combining value and have never experienced any difficulty in explaining them in the light of algebraically expressed combining numbers as described.

From the facts presented it appears that our common understanding of valence is incomplete and inadequate, and that units of combining value must be counted algebraically, designating the units of hydrogen valence as minus-values, and those of oxygen valence as plus-values, in order to bring out their true and full meaning.

Identical or closely related views upon one or more of the points referred to in this paper will be found as follows:

O. C. Johnson, *Chem. News*, 42, 51, 1880.

A. B. Prescott, *Proc. A. A. A. S.*, 36, 130, 1887.

Oscar Oldberg, *Inorg. Chem.*, Chicago Med. Book Co., 1900.

W. A. Noyes and A. C. Lyon, *J. Am. Chem. Soc.*, 23, 460, 1901.

Julius Stieglitz, *J. Am. Chem. Soc.*, 23, 796, 1901.

R. Abegg, *Z. anorg. Chem.*, 39, 330-380, 1904, and *Ibid.*, 43, 116-124.

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SOME NOTES ON THE CLASSIFICATION OF THE PRINCIPAL INORGANIC CHEMICAL COMPOUNDS.

BY OSCAR OLDBERG.

Some of the modern text-books on chemistry treat of ionization in such a way as to leave in the mind of the student rather confused notions of the classification of common inorganic compounds.

A scientific classification of chemical compounds should be based first upon structure and next upon properties. It should, therefore, take into account the number of component elements and their respective properties and combining values, and the inter-atomic linking and chemical behavior of the compounds.

The great classes of inorganic chemical compounds generally recognized are:

1. *Binary Compounds*, including fluorides, chlorides, bromides, iodides, oxides, sulphides, etc.

True binary compounds might be defined as those containing but two elements united in such a way that each atom of one element is in immediate combination with each atom of the other and in which each atom of either of the component elements exhibits the same valence as that possessed by any other atom of the same element.

Under this definition HCl and H_2S which in several modern text-books are classed with the acids, and NaCl and K_2S which are described as salts, would be assigned to the chlorides and the sulphides.

The compounds H_2O_2 , CaS_2 , Fe_3O_4 , etc., are not strictly speaking binary compounds although containing but two elements.

2. *Acids*, which might be defined as the hydroxides of all non-metallic elements, and the hydroxides of any metals exercising a valence above 4. To avoid confusion these acids might be designated as hydroxyl acids.

The hydroxyl acids include hydroxides of normal structure composed of one atom of the acidic element holding in combination with itself one hydroxyl group for each unit of valence [as exemplified by $(\text{HO})_x\text{B}$]; also the meta-hydroxides composed of the acidic element holding additional or non-linking oxygen as well as hydroxyl [as $(\text{HO})_x\text{SO}_n$], and the hydroxides composed of the acidic element holding additional hydrogen as well as oxygen (as HOPH_2O).

Under this definition neither hydrogen chloride nor hydrogen sulphide would be classed among the acids.

The *thio-acids* should be called by that name.

3. *Bases* should be defined as the hydroxides of metals having a valence not exceeding 4. The bases are composed of basic elements and hydroxyl.

4. *Salts* might be defined as compounds formed by basic elements linked to acidic elements by oxygen with or without additional hydrogen or oxygen. Under this definition no binary compound is a salt.

Thio-salts contain linking sulphur instead of linking oxygen.

COMMENTS.

Scientific classification would seem to demand the separation of all binary compounds from compounds containing three or more elements if structure be the primary basis of classification. The hydroxyl acids are very numerous, inorganic and organic. They are all of essentially like structure radically different from that of the fluoride, chloride, bromide and iodide of hydrogen. The presence of the "linking oxygen" in the hydroxyl acids and in the salts they form gives them a characteristic structure.

Many compounds which are not acids have an acid taste and an acid reaction on litmus, and the power to neutralize the properties of the alkalis is possessed by the halogens themselves as well as by their hydrogen compounds.

The chlorides of carbon, phosphorus, arsenic, sulphur, iodine, etc., are not salts; but the chlorides of the metals have the same structure.

The structure of all sulphides is precisely the same as that of the oxides.

The fact that HF, HCl, HBr, HI and H_2S yield hydrions does not seem to constitute sufficient ground for giving the common class name of "acids" to such dissimilar compounds as HONO_2 , HCl and H_2S , and the common class name of salts to such dissimilar compounds as KONO_2 , KCl and K_2S .

The halogens in the halides and the sulphur of the sulphides are negative elements in those compounds, being always united to positive elements; but the acidic elements of hydroxyl acids, oxygen salts and thio-salts are positive elements because united to oxygen, or to sulphur performing the functions of oxygen.

The *acidic element* of a hydroxyl acid is that element which in combination with the hydroxyl (with or without additional oxygen or hydrogen, or both) constitutes that acid. All hydroxides and metahydroxides of chemically non-metallic elements, except hydrogen hydroxide, are universally recognized as acids. Any metallic hydroxide is an acid whenever the metal in it has a valence exceeding four. The most strongly marked acidic hydroxides or acids are those in which the acidic element possesses a comparatively high valence.

The valences of elements performing acidic or basic functions are not their hydrogen valences, but their oxygen valences. While hydrogen is contained in every acid, the most essential element in any hydroxyl acid is not its hydrogen. It is, in fact, neither the hydrogen nor the oxygen, but the third or acidic element that is essentially characteristic of them.

Potassium hydroxide, KOH, is a base, while ClOH is an acid. Hydroxyl is contained in both. The fact that KOH gives hydroxidions and the ClOH hydrions in electrolytic dissociation does not seem to be convincing evidence that KOH owes its alkaline properties to the OH, and that ClOH owes its acid properties to the H. Basic hydroxides split up so as to give hydroxyl ions because they are hydroxides of basic elements; acidic hydroxides give hydrogen ions because they are hydroxides of acidic elements. The basic character and alkaline reaction of the KOH must be due essentially to the K, and the acidic character of ClOH is due essentially to the Cl. The acid character of $(\text{HO})_2\text{SO}_3$ is apparently due to the S, and the character of HONO_2 to the N, *in conjunction with the hydroxyl*.

The modern doctrine that the hydrogen is the most important element of any acid, and that its acid properties are due to that hydrogen appears to be inconsistent with the fact that the most pronouncedly acid of all the hydroxyl acids are not those that contain the most hydrogen, but those that contain the most oxygen. Of any two hydroxyl acids formed by the same acidic element and containing the same number of hydrogen atoms,

the stronger acid is the one in which that element has the higher valence, and in which there is accordingly a greater proportion of oxygen, as may be seen by comparing $(\text{HO})_2\text{SO}_2$ with $(\text{HO})_2\text{SO}$, HONO_2 with HONO , HOPO_2 with HOPH_2O , and HOCLO_2 with HOCl .

All the organic acids contain hydroxyl united to carbonyl. All the inorganic oxygen acids also contain hydroxyl. The "replaceable hydrogen" of all those acids is the hydrogen of the hydroxyl, and no other hydrogen. Whenever compounds are split up by electrolytic dissociation the free bonds of the cations are those of positive elements, and the free bonds of the anions are those of negative elements. When acids are dissociated the free bonds of the cations are hydrogen bonds, but when bases and salts are dissociated the free bonds of the cations are those of the metals or of the atomic groups which take the place of the hydrogen of the acid. When bases, oxygen acids and oxygen salts are dissociated the free bonds of the anions are in every instance those of the linking oxygen.

An acid has been described as a hydrogen compound from which the H can be liberated by some metal which replaces the H with the result that a salt is formed. But if potassium zincate is a salt, as it is commonly held to be, then KOH would under that definition be an acid, whereas it is the very opposite.

EXAMPLES OF BINARY COMPOUNDS CLASSIFIED ACCORDING TO STRUCTURE.

1. <i>Hydrogen Compounds.</i>	2. <i>Chlorides, Bromides, and Iodides.</i>	3. <i>Oxides.</i>	4. <i>Sulphides.</i>
HF	HCl	H_2O	H_2S
HCl	KCl	Ag_2O	Ag_2S
HBr	SnCl_2	BaO	BaS
HI	ZnCl_2	HgO	HgS
H_2O	ICl_3	CO_2	CS_2
H_2S	NI_3	PtO_2	PtS_2
H_2Se	PCl_3	P_2O_3	P_2S_3
H_2Te	AsI_3	As_2O_3	As_2S_3
H_3N	SbCl_3	Sb_2O_3	Sb_2S_3
H_3P	AlCl_3	Fe_2O_3	Fe_2S_3
H_3As	SnCl_4	P_2O_5	P_2S_5
H_3Sb	CCl_4	As_2O_5	As_2S_5
H_4C	PtCl_4	Sb_2O_5	Sb_2S_5
H_4Si		TeO_2	TeS_2

How many students can identify the acids and the salts among these compounds according to modern definitions?

Northwestern University School of Pharmacy.

The papers just read were discussed at some length by Messrs. Puckner, Vanderkleed, Asher, Sadtler, Coblenz, C. E. Caspari and Oldberg, the discussions at times taking a very technical range. Several of

the speakers took sharp issue with the author of the paper. Mr. Puckner expressed the opinion that the classification theory was the curse of pharmaceutical education; that there was too much theory and definition, and not enough teaching. Mr. Sadtler thought the arrangement proposed had some advantages, but he did not like it because it took away certain points for comparison which were desirable. He considered this a violent twisting of the periodic system, which was not justified by the advantages claimed.

The Chair said there were four or five papers, the authors of which were either not present or the papers received too late to have a place on the program, and suggested that they be read by title and referred. One of these was a paper on the subject of a "Preliminary Report on Marrubiin," by H. M. Gordin and another was upon the subject of certain sources of error in the "Chemical Examination of Urine," by Joseph L. Mayer, which paper was received too late to be listed in the program; also, two papers by C. E. Parker, of the Drug Laboratory, Bureau of Chemistry on "Opium Assay with Use of Lead Subacetate," and "A Mechanical Agitator for Drug Assaying." Also a paper on "Fluidextracts," by Joseph Feil. This latter paper, the Chairman said, consisted of a table compiled by Mr. Feil, showing certain facts as to the alkaloidal strength of fluid-extracts, both as stated on the label taken from different manufacturers and by calculation, taking into account the amount of extractive to the amount of moisture in the drug. He said he did not agree with some of the conclusions stated in the paper. Also a paper on "*Scopola* vs. *Belledonna*," by A. R. L. Dohme, and one on the "Value of Predigested Foods," by Mr. Dohme and Mr. Engelhardt. These papers, the Chair said, would, without objection, be read by title, and referred for publication, and it was so ordered.

The Chair next called for a paper by Mr. A. B. Stevens, on the subject of "Poison Sumac," and Mr. Stevens gave a verbal abstract of his paper, exhibiting several specimens of sumac, and the resins derived therefrom.

POISON SUMAC.

BY A. B. STEVENS AND L. E. WARREN.*

Rhus vernix Linné (*Rhus venenata* De Candolle) (Fam. *Anacardiaceæ*), known by various names, such as poison sumac, † poison dogwood, † poison elder, † poison-tree, † poison wood, ‡ poison ash, || swamp sumac || or swamp dogwood, || is a small shrub or tree, six to eighteen or occasionally

* Holder of Frederick Stearns & Co. Fellowship of Pharmaceutical Chemistry.

† "Silva of N. Am." C. S. Sargent, III, 23-24.

‡ "Trees and Shrubs of Mass." G. B. Emerson, II, 575.

|| "Plant Names, Scientific and Popular." A. B. Lyons, 321.

twenty-five * feet in height, which attains a diameter of from three to six or even ten † inches. It is found in swamps widely scattered over the eastern portions of North America, from Canada to Florida, and west to Minnesota and Louisiana. ‡

The bark is mottled-gray or brownish gray, smooth on the branches and young shoots, but somewhat roughened on the trunks of the older trees. The leaves are compound, each leaf stalk bearing five to thirteen nearly sessile, ovate, obvate, or oval, beautiful green leaflets, each of which is acute at the apex and smooth at the edges. In autumn the colors of the foliage become extremely brilliant, scarlet, orange and yellow predominating. In consequence of its attractive appearance at this season many collectors, ignorant of its venomous properties, are poisoned by it each year. § The small greenish-yellow flowers, which appear late in June or early July, are borne on long, loose panicles from the axils of the leaves. The sterile and the fertile flowers are borne on separate plants. The fruit is a drupe, 4 to 6 Mm. in diameter, unequal-sided and somewhat flattened. At maturity in September the outer coat is thin, more or less striated, grayish-white and lustrous; the stone is pale yellow in color and noticeably grooved.

The fruit remains on the tree until spring. On wounding the trees, a pale cream-colored, thick, poisonous juice exudes in abundance. This begins to darken at once and finally becomes black.

Very little work has been done upon the chemistry of the poison of *Rhus vernix*. A number of chemists, however, have worked upon the poisonous constituents of Japanese lac (*Rhus vernicifera*) and of poison ivy (*Rhus radicans*), and, as clinical observation has established that the dermatitis caused by any one of the venomous species of *Rhus* is similar in appearance to that from the others, it is now generally believed that the poisons from all these plants are identical. We give below a brief digest of the results that have been obtained by previous investigations of the constituents of these plants.

In 1815 Dr. Bigelow || experimented upon the juice of *Rhus vernix*, and showed that it possessed varnish-forming properties similar to the juice from Japanese sumac. He says:

"A quantity of the juice was boiled alone until nearly all the volatile oil had escaped, and the remainder was reduced almost to the state of a resin. In this state it was applied while warm to several substances, which, after

* "Silva of N. Am." C. S. Sargent, III, 23.

† "Trees of New Eng." Dame and Brooks, 136.

‡ "Silva of N. Am." C. S. Sargent, III, 23.

§ "Trees of N. Eng." Dame and Brooks, 187; also "Silva of N. Am." C. S. Sargent, III, 24.

|| "Medical Botany," J. Bigelow, 1, 101-102.

cooling, exhibited the most brilliant, glossy, jet-black surfaces. The coating appeared very durable and firm, and was not affected by moisture. It was elastic and perfectly opaque, and seemed calculated to answer the purposes of both paint and varnish." Dr. Bigelow seems to have done no further work upon the chemistry of the juice.

In 1859 J. Khittel * worked upon poison ivy. He attributed the poisonous properties of this plant to a volatile alkaloid. He did not succeed in isolating any alkaloids, however, so that his results were of but little value.

In 1865 J. M. Maisch † denied the presence of a volatile alkaloid in poison ivy, but announced the discovery of a new volatile acid to which he ascribed the poisonous properties of that plant, and to which he gave the name "*toxicodendric acid*." He prepared salts of this acid, and stated that its properties were somewhat similar to those of formic acid and acetic acid, but more nearly like the latter. The conclusions of Professor Maisch remained unverified for thirty years, and standard works on pharmacology quoted them without question until Dr. Pfaff investigated the subject in 1894-1896.

Dr. Pfaff ‡ proved that the "*toxicodendric acid*" of Maisch was *acetic acid*, and that the real poison of ivy (and sumac) existed in an oily substance which he named "*toxicodendrol*," and which was completely *non-volatile*.

He states that he prepared this oil § by repeated fractional precipitations of its lead salt from alcoholic solution by means of alcoholic solution of lead acetate. The free oil was obtained from its lead compound by decomposing the latter with ammonium sulphide. He found the poisonous oil in all parts of the plant—stems, branches, roots, leaves and fruit. It was present in both ivy and sumac, but more abundant in the latter. Dr. Pfaff does not state whether the "*toxicodendrol*" was obtained from the green or the ripened fruit, an omission to which we will again refer. According to this author, "*toxicodendrol*" is soluble in ether, alcohol, chloroform and similar solvents, but is insoluble in water.

It is easily decomposed by heat and is partially converted into resin on long standing. None of its other physical or chemical properties or constants were determined. The fruit of *Rhus toxicodendron* contained 3.6 per cent. of crude oil (*i. e.*, active oil contaminated with resinous matter and with oil not precipitated by lead acetate), the leaves 3.3 per cent. and the stems and branches 1.6 per cent.

* Wittstein's Vierteljahresschrift für praktische Pharmacie, 7, 348-359; abstract Am. J. Pharm., 1858, 542-544.

† Proc. Am. Pharm. Assoc., 1865, 166.

‡ J. Exp. Med., Vol. 2, No. 2, 1897.

§ J. Exp. Med., Vol. 2, No. 2 (1897), 187.

Rhus vernicifera, the Japanese varnish tree, exhibits poisonous properties similar to the American sumac. The milk juice, which exudes when the plant is wounded, forms the Japanese lac of Oriental commerce. Several chemists have investigated the properties of this juice. The earliest was Ishimatsu, who reported* that the lac had a sweetish odor, an irritating taste, that it burned with a luminous flame, which emits dense black smoke, and that it mixes with fixed oils in all proportions. He found that the lac consisted of a substance soluble in alcohol, a gum soluble in water, a residue insoluble in alcohol or water, and small quantities of water and "volatile poison."

His method of separation was to extract the milk juice with absolute alcohol, evaporate the solvent and dry the dissolved portion at 100° C. to constant weight. The portion insoluble in alcohol was extracted with hot water, filtered, the filtrate evaporated and the residue dried at 100° C. and weighed as gum. The residue insoluble in water was dried at 100° C. and weighed. Water and volatile matter were determined by difference.

He found that the fresh lac yielded 58.24 per cent. of substance soluble in alcohol. This alcohol-soluble substance was brownish-black in color and had the same odor as the original; however, it never dries to a varnish as that does. Lead salts of this compound were prepared and analyzed, from which the formula $C_{20}H_{30}O_2$ was calculated. No experimental proof that the poisonous constituent was volatile was offered.

In 1883 H. Yoshida,† employing Ishimatsu's method of separation, found 85.15 per cent. of alcohol-soluble substance in fresh lac of known purity. He called this soluble substance *urushic acid* (from *Ki-urushi*, Japanese lac). He states that the gum is identical with gum acacia, and reports the portion insoluble in alcohol or water as diastatic matter. He proved that the hardening of the lac was due to an oxidizing enzyme acting in the presence of moisture. Like the previous investigator, Yoshida believed that the poisonous constituent of the lac was volatile, but offered no experimental proofs for this supposition. Yoshida found that urushic acid was soluble in benzin, ether and carbon disulphide; less easily soluble in amyl alcohol and petroleum of high boiling-point; insoluble in water; sp. gr. 0.9851 at 23° C. It remains unchanged at 160° C. but slowly decomposes with carbonization at 200°. From the alcoholic solution of urushic acid many salts were prepared, most of which were slightly soluble in alcohol, but insoluble in water. From the analysis of its lead salt Yoshida calculates the formula $C_{14}H_{18}O_3$ for urushic acid. By oxidizing urushic acid with chromic acid and analyzing the product obtained, he concluded that this acid takes up one atom of oxygen to form *oxyurushic acid*, $C_{14}H_{16}O_5$. He prepared and analyzed a bromine derivative of urushic acid, to which he ascribed the formula $C_{14}H_{12}Br_2O_7$.

* Manchester Lit. and Philos. Soc. [3] 1882, 249.

† J. Chem. Soc., 1883, 472.

In 1905 Tschirch and Stevens* showed that the *volatile* principle of Japanese lac was *acetic acid* and that the *poisonous constituent* was a resinous substance which was *non-volatile*. This resinous substance was obtained by extracting the lac with alcohol and evaporating the filtrate (as Ishimatsu and Yoshida had done), taking up the residue with petroleum-benzin (b. p. below 65° C.) and pouring the solution into a large excess of fresh petroleum-benzin. A non-poisonous, semi-fluid resin was precipitated, while the poisonous substance remained in solution and was obtained as a dark, brownish-red oil on decanting and evaporating the solvent. By agitating the benzin-soluble portion with ethyl alcohol and petroleum-benzin in immiscible proportions, the poisonous principle remained in the alcoholic layer on separation. An oily, non-poisonous, brownish-red residue was left on evaporating the benzin layer, while the alcoholic layer gave a poisonous resin of similar appearance. Three fractions were thus obtained, but one of which was poisonous. Analyses of these will be referred to later. All were soluble in alcohol and all gave black precipitates with alcohol-soluble salts of mercury, iron, copper and silver. Lead acetate gave a gray precipitate, which became darker on standing. By oxidation all of the resinous substances gave a brown insoluble substance which the authors called *oxyurushin*,† and to which they gave the formula $C_{100}H_{130}N_2O_{19}$.

Gum and diastatic matter were also obtained from the lac, but the authors were unable to separate them. By using Ishimatsu's method of separation Tschirch and Stevens found the following results for Japanese lac : ‡

	Per Cent.
Soluble in alcohol.	72.40
Soluble in water.	4.05
Insoluble residue.	2.35
Water and volatile matter.	21.20

The alcohol-soluble portion was further separated into two portions by petroleum-benzin, as noted above, with the following results :

	Per Cent.
Benzin-soluble.	78
Benzin-insoluble.	22

By means of methyl alcohol and ether the benzin-insoluble portion could be further separated into three fractions.

The gum enzyme contained nitrogen, yielded mucic, oxalic and tartaric acids on oxidation with nitric acid, and produced a non-crystallizable, non-

* Arch. Pharm., 243, 516.

† Arch. Pharm., 243, 524.

‡ Arch. Pharm., 243, 515.

fermentable, dextro-rotatory, reducing sugar on hydrolysis with dilute sulphuric acid. The phenylhydrazine * derivative of this sugar melted at 162° – 164° C., corresponding to phenylsorbinosazone.

The gum enzyme was very active, its aqueous solution rapidly changing freshly-prepared tincture of guaiac to a deep blue color. This action was far stronger and more rapid with lac gum than with any other of the eleven gums tried. Tacamahacā, asafetida and acacia approached lac gum most nearly in this respect.

Recently Acree and Syme † have worked upon poison ivy. They found gallic acid, fisetin, rhamnose and a "poisonous tar, gum or wax" in the extract prepared by maceration of the leaves and flowers of poison ivy with ether, and subsequent distillation of the solvent. The lead compound of this poisonous substance was found to be soluble in ether. The authors utilized this property to free the poisonous material from admixed non-poisonous substances. Lead compounds were first prepared by precipitating an alcoholic solution (of the ether extract of the drug) with lead acetate. The precipitate was washed with water, partially dried over sulphuric acid, placed in a Soxhlet apparatus and extracted with ether until the solvent came over colorless. A green solution was obtained, which was washed with water and decomposed with hydrogen sulphide. On evaporating the solvent, a black poisonous "tar or gum" remained. Upon hydrolysis ‡ with two per cent. sulphuric acid this poisonous substance gave fisetin, rhamnose and gallic acid. The residue in the thimble was decomposed by hydrogen sulphide, shaken with ether and evaporated. A hard, brittle, yellow, non-poisonous resin was given. The authors believe that the poisonous principle of poison ivy is a complex substance of glucosidal nature.

In our investigations we have used the juice from *Rhus vernix*, which was collected for the most part in October.

METHOD OF GATHERING THE JUICE.

With a knife having a V-shaped blade incisions 5 to 10 Cm. apart and about 5 Mm. in depth, were made around the trunk, and larger branches, perpendicular to the axis of the stem. The juice, which oozes out abundantly, was collected by scraping out the grooves with a sharpened stick, and discharging the adnering lac into a wide-mouthed bottle. By drawing the stick across a string stretched across the mouth of the bottle, the process is greatly facilitated. The juice fills the grooves in from 5 to 20 minutes after the incisions are made, and, unless gathered at once, is prone to overflow. The juice occurs as a thick, yellowish-white, sticky emulsion,

* "Japanese Lac." Dissertation. A. B. Stevens, 17, 1905.

† Am. Chem. J., 36, 301–321, 1906.

‡ Acree and Syme, Am. Chem. J., 36, 316.

which on exposure begins at once to change to brown and finally becomes black. If exposed to the air in an open container a black skin of oxidized substance forms over the surface, which protects the portions below from change. The juice has a peculiar odor, which seems to be characteristic of the sumac plant. By the above method of collection four trees of average size yielded a mean of 8.09 Gm. of juice.

VARNISH PROPERTIES OF THE LAC.

We have made several experiments to ascertain whether this juice could be employed as a varnish like the Japanese lac. In 1815 Dr. Bigelow* had concluded that the juice of the American poison sumac might be used as a varnish. His method of application, however,† was not like that employed by the modern Japanese for their lacquered wares. We have employed a method somewhat similar to that of the Japanese, as reported by Rein.‡

Three smooth pine sticks were treated as follows: No. 1 was treated with a thin coat of lac, No. 2 with a thick coat of the same, while No. 3 received a coating of a mixture consisting of raw lac 70 and water 30. The sticks were permitted to remain at ordinary temperature in a closed vessel saturated with aqueous vapor (Scheibler desiccator charged with water) for twenty-four hours, then removed from the moist atmosphere and dried in an air bath at 50° C. Three successive coats were applied at intervals of forty-eight hours, care being taken to maintain the order and treatment as given above. All three sticks became covered with a glossy, black varnish which could be readily polished. At the close of the experiments no appreciable difference was noted between No. 1 and No. 2. No. 3 dried more rapidly than the other two, but was otherwise similar. From these experiments and from other observations on the behavior of the lac (made while carrying out other experiments) we are led to concur with Dr. Bigelow in the belief that this juice could be employed as a varnish as a substitute for the Japanese article.

CHEMICAL INVESTIGATION OF THE JUICE.

The juice was first strained through two thicknesses of dry cheese-cloth to remove bark and other foreign matter. It was then stirred to insure a uniform composition. Its reaction was faintly acid to litmus paper; sp. gr. 0.99762 at 20° C./20°C.

Fifty grammes of the juice were placed in a steam distillation apparatus and distilled for five hours. The distillate was neutral to litmus. The emulsion in the distilling flask was scarcely changed in appearance.

* Med. Botany, J. Bigelow, i, 101-102.

† See page 4.

‡ The Industries of Japan, J. J. Rein, 339-77.

Twenty cubic centimeters of 10 per cent. H_2SO_4 were then added to the contents of the flask and the distillation continued for five hours more. The emulsion was broken up by this treatment, so that the mixture separated into two layers on standing and cooling. This distillate was very slightly acid to litmus. A trace of alkali was added to each of the distillates, after which they were evaporated separately to a small bulk. No acetic acid could be detected in either by tests with ferric chloride, sulphuric acid and ethyl alcohol, or arsenous acid and alkali. The distillates and the residue in the distilling flask were each separately shaken out with ether and ethereal layers evaporated. Only mere traces of a pale yellow, oily residue remained from the distillates, while the contents of the distilling flask yielded about 45 grammes of a dark red, oily substance. None of these oily residues were poisonous. As the original material was highly poisonous, it is evident that the poisonous properties of the lac are destroyed by long-continued heating.

In our investigations we have employed two methods of testing for poisonous properties. The first was one used by Stevens* in his work on Japanese lac. A hole about 6 Mm. in diameter was cut with a cork borer through a piece of gummed paper, the paper pasted on the arm and the suspected substance applied to the opening by means of a glass rod. In thirty minutes the paper was removed and the arm thoroughly washed with ether. If the substance were poisonous the spot became red and began to itch in twenty to thirty hours. The second method was one used by Dr. Jadassohn,† of the University of Bern, and reported by Tschirch and Stevens. It consisted in rubbing a drop of the suspected substance by means of a glass rod upon the inner surface of the ear of a rabbit. If poisonous redness and swelling would appear in two to five or six days, followed by watery blisters and even by necrosis of the superficial layers of the skin, this condition would gradually disappear after about two weeks. In the case of the rabbit we have found the symptoms of poisoning by *Rhus vernix*, similar in all respects to those caused by *Rhus vernicifera*.

SEPARATION OF THE RESINS FROM THE LAC.

A large sample of the strained lac was agitated with three volumes of 95 per cent. alcohol and poured on a filter. A brownish residue remained undissolved, which became darker on further exposure to the air. This residue was again shaken with alcohol and the process repeated until the filtrate became colorless. The insoluble portion was then washed with ether and dried in the air. It was a reddish-brown powder, only partially soluble in water. The alcoholic filtrate was evaporated under reduced

* Am. J. Pharm., 78, 63.

† Arch. d. Pharm., 243, 528.

pressure. It gave a dark, amber-red, oily liquid. These residues were reserved for further study.

To determine the composition of the lac by solubility, we employed a modification of the method used by Ishimatsu for Japanese lac. The method used is as follows: Five grammes of the strained lac were transferred from a weighing bottle to a mortar, triturated with 95 per cent. alcohol, allowed to settle five minutes, and the supernatant solution decanted through a tared Gooch crucible containing a mat of asbestos at least 1.5 centimeter in thickness. More alcohol was then added to the residue in the mortar and the trituration and decantation repeated. The insoluble residue was then transferred to the Gooch, washed twice with strong alcohol, once with ether, dried at 100° C. and weighed. The percentage insoluble in alcohol was calculated from this. To determine the portion insoluble in water the dried residue in the Gooch crucible, together with the upper layers of asbestos, was transferred to a mortar and repeatedly triturated with hot water. The mixture was passed through the Gooch in which the alcohol-insoluble residue was first weighed, the residue washed with hot water, dried at 100° C. and weighed. The residual weight represents the portion insoluble in water (or alcohol) and the loss in weight the portion soluble in water. The determinations were made in duplicate and in triplicate, the results usually being very concordant. From the tabulated results given below it will be seen that the composition seems to vary somewhat in different months and also from different parts of the tree, though the number of determinations made was insufficient to establish the extent of such variations. The specific gravity would probably vary also, but no experiments were made to verify this supposition.

Date of Collection.	Soluble in Alcohol. "Crude Resin."	Insoluble in Alcohol.	Insoluble in Alcohol.		Water (by difference).
			Soluble in Water.	Insoluble in Water.	
October 20, 1905 ...	80.458	6.134	4.393	1.741	13.408
June 1, 1906.....	79.608	5.316	3.371	1.945	15.076
August 29, 1906.	75.892	5.175	3.476	1.699	18.933
October 20, 1906 ...	84.330	5.699	3.994	1.705	9.971
From near foot of trees, Nov. 3, 1906.	80.223	8.018	5.393	2.625	11.759

For comparison we append a tabular statement of the composition of Japanese lac compiled from the reports of various workers.

Observer.	Soluble in Alcohol. "Urushic Acid."	Insoluble in Alcohol. Calculated by Stevens and Warren.	Gum.	Nitrogenous Residue.	Water and Volatile Matter (by difference).
Ishimatsu.....	58.24	8.59	6.32	2.27	33.17
Yoshida	85.15	5.43	3.15	2.28	9.42
Korshelt and Yoshida	80.00	8.00	4.69	3.31	12.00
			Insoluble in Alcohol.		
			Soluble in Water.	Insoluble in Water.	
Tschirch and Stevens	72.40	6.40	4.05	2.35	21.20

RESIDUE INSOLUBLE IN ALCOHOL.

The alcohol-insoluble residue was dissolved in cold water as completely as possible (by titration in a mortar with a small quantity of water and filtered into a small quantity of alcohol. The resulting mixture was then poured into a large volume of alcohol. A white precipitate was produced which, after purification by repeating the above process several times, was found to have the properties of the gum obtained by Ishimatsu,* Stevens† and others from Japanese lac. In most respects it was similar to gum acacia under the same conditions. When prepared as described above, after filtering and drying, this gum possesses a powerful enzymatic action far exceeding that of acacia. Its aqueous solution rapidly changes freshly prepared tincture of guaiac to a deep blue color; with naphthal it produces a purplish-blue color, and with guaiacol a red color in 30 minutes; no effect was produced with vanillin and hydrochloric acid. An aqueous solution of the gum-enzyme does not convert starch paste into reducing sugars even by standing at 40°C. for 96 hours. An emulsion prepared from the gum-enzyme, water and the separated resins, blackens on standing like the fresh lac. An aqueous solution of the gum-enzyme is rendered inactive by boiling, though the fresh lac may be boiled in 95 per cent. alcohol for twenty minutes without becoming completely inactive. By boiling for eight hours with 2 per cent. sulphuric acid the purified gum yields a non-crystallizable, non-fermentable, dextro-rotatory sugar, which reduces Fehling's Solution, but has no effect on Barfeld's solution of cupric acetate. The purified gum contained appreciable quantities of nitrogen, which could not be removed by repeated precipitations with alcohol.

* Manchester Lit. and Philos. Soc. [3], 249. 1882.

† "Japanese Lac." Dissertation. A. B. Stevens, No. 43. 1906.

It was found that the portion insoluble in water could not be completely freed from gumming or mucilaginous matters even by repeatedly triturating with cold water or by long-continued boiling with the same solvent. After the most thorough washing with water the insoluble residue (if-unboiled) still produced a blue color when kept for several hours in contact with water to which a few drops of tincture of guaiac have been added. It was of a rich, chocolate-brown color, odorless and tasteless. When boiled for five hours with 2 per cent. sulphuric acid it yielded only the merest traces of reducing sugars without appreciable change in bulk. Probably these traces of sugar were derived from minute quantities of gummy matters remaining in the sample, which had failed to be removed by previous boiling and washing with water. When examined by the Lassaigue test and by the Kjeldahl quantitative method the substance was found to be rich in nitrogen. When boiled with dilute potassium hydroxide it darkened, forming a hard, brown-black substance which could not be powdered readily. Neither the gum nor the portion insoluble in water was poisonous.

CRUDE RESINS.

On evaporation the alcoholic filtrate from the lac gave a dark, ambered, oily, non-volatile liquid, having a peculiar, not unpleasant odor, suggestive of the original juice. Evidently the odor of the plant is due to this oily substance. A drop of it, when allowed to sink into paper, produces a "grease-spot" like a true fat or oil. It is not a fat, however, as it produces no glycerol when saponified. It has a faintly acid reaction, a specific gravity of 0.9888 at 25° C./25° C., and is soluble in the usual solvents for resins and oils. When tested on the ear of a rabbit it was found to be very poisonous. It does not possess the properties of a glucoside or of an alkaloid. When dissolved in chloroform it unites with bromine and with iodine with great violence, with copious evolution of hydrobromic or hydriodic acids. On evaporating the solvent, a hard, black, varnish remains, which is very lustrous and apparently durable.

Following the nomenclature adopted by Tschirch and Stevens in their work on Japanese lac, we have designated the alcohol-soluble portions of the latter from *Rhus vernix* as *resins*, though they do not possess all the properties generally attributed to these bodies. In general, however, their properties were found to conform more nearly to the resins than to any other class of organic products.

SEPARATION OF THE LAC-RESINS.

In all proportions the crude resin was found not to be completely soluble in methyl alcohol, oil of turpentine, and petroleum benzin. With slight deviations, the method devised by Tschirch and Stevens* for the

* Arch. d. Pharm., 243, 518.

separation of the lac-resins of Japanese lac was used in our work. As finally adopted the method was as follows: 100 Cc. of the crude resins were dissolved in 900 Cc. of petroleum benzin (b. p., below 50° C.), forming a clear, dark amber-red solution. This was then slowly poured with stirring into 9,000 Cc. of cold benzin; a dense, brownish-gray cloud was immediately formed, which slowly subsided. At the end of twenty-four hours the supernatant liquid was clear and could be decanted with ease. A red-brown, semi-fluid mass remained, which was insoluble in fresh benzin.

BENZIN-INSOLUBLE RESIN.

The benzin-insoluble resin was washed repeatedly by covering it with benzin in a shallow dish and stirring with a glass rod until the washings became colorless. On drying the residue over H_2SO_4 under reduced pressure, a very viscous, red-brown, resinous, sticky mass, having the odor of the crude resin, was obtained. This substance, which amounted to 15.5 per cent. of the original, had a sp. gr. of 1.05167 at 25° C. / 25° C. It slowly hardened at ordinary temperature and was not poisonous. By heating for several hours at 110° C. it yielded a solid, dark-brown mass, which was insoluble in all ordinary solvents and was exceedingly difficult to pulverize. Analysis of the dried product gave the following results:

I.

0.3165 Gm. gave 0.2121 Gm. H_2O and 0.8683 Gm. CO_2 .

II.

0.3382 Gm. gave 0.2326 Gm. H_2O and 0.9295 Gm. CO_2 .

I.

0.5026 Gm. gave 9.6 Cc. N at 23° C. and 739 Mm.

II.

0.5014 Gm. gave 9.5 Cc. N at 23° C. and 736 Mm.

	I.	II.	Mean.
	Per Cent.	Per Cent.	Per Cent.
Hydrogen.....	7.527	7.693	7.610
Carbon.....	75.129	74.955	75.042
Nitrogen.....	2.092	2.067	2.079

The undried resin was soluble in alcohol, chloroform, glacial acetic acid, and partially soluble in ether and methyl alcohol; it was insoluble in glycerol, water or petroleum benzin. When boiled with alcoholic KOH, the undried resin yielded a brown-black soap, soluble in water, and a brownish-black insoluble substance, but no glycerin. Aqueous solutions of this soap lather considerably when shaken, but have no detergent properties. The properties of the insoluble substance are similar to those of "oxyrurushin" obtained by Tschirch and Stevens * from Japanese lac.

* Arch. d. Pharm., 243, 523.

Many attempts were made to determine its saponification number, but, owing to the great difficulty of determining the end reaction with indicators in the opaque, red-brown soap solution, no satisfactory results were obtained. Numbers were found varying from 286.7 to 344.2 Mg. of KOH. Litmus, phenolphthalein, methyl-orange and alkali blue, were all tried, both as external and internal indicators, but the exact point of neutrality could not be determined. The indirect method of McIlhiney * was also tried, but without success, as the resin soap is not completely soluble in alcohol. This benzin-insoluble resin could not be acetylated by treatment with sodium acetate and acetic anhydride. It reacts with bromine, producing a black compound similar in appearance to that from bromine and the crude resin. It did not respond to the Lieberman-Storch † reaction for resins.

BENZIN-SOLUBLE RESIN.

On evaporation the solution in benzin gave a beautiful, clear, amber-red, oily, non-volatile liquid, amounting to 79.5 per cent. of the original resin. In color and odor it resembles the original resin, but its fluidity is greater and specific gravity less. Sp. gr. at 25° C./ 25 C.—0.9693.

Its color is much lighter and its fluidity considerably greater than its companion resin, the benzin-insoluble portion. Its specific gravity is also considerably less. It was found to be soluble in aniline, amyl-alcohol, acetone, acetic-ether, benzol, petroleum-benzin (b. p. below 50°C.), chloroform, carbon disulphide, carbon tetrachloride, ethyl alcohol, methyl alcohol, ether and toluol. Its alcoholic solution is optically inactive. It is very poisonous. It blackens with alkalis, like its companion resin, and yields a brown-black, soluble soap on saponification, without the liberation of glycerol. Its saponification number could not be obtained with exactness, as the same difficulties were encountered in determining the end reaction with indicators as was the case with the benzin-insoluble portion. Unlike the latter, however, it does not dry up appreciably on long standing or moderate heating. It unites with bromine and iodine, forming black, insoluble compounds with evolution of heat and liberation of the corresponding halogen acids. By subjecting the resin to the Grignard reaction, ‡ using magnesium methyl iodide, it yields an abundance of methane, thus indicating § the presence of hydroxyl groups. The resultant magnesium organic halide blackens on exposure to air and is not poisonous. The resin contains no methoxyl or ethoxyl groups, as shown by negative results when tested by Zeisel's method. || It contains neither sulphur nor

* Jour. Amer. Chem. Soc., 16, 408.

† J. S. C. I., 1888, 136.

‡ Grignard: Ann. Chem. Phys. [7], 24, 433.

§ Tschugurff: Ber. d. Chem. Ges., 35, 3912.

|| Zeisel: Monats. f. Chem., 6, 989.

halogens. All attempts to crystallize it or to obtain a crystalline derivative were unsuccessful. By heating with acetic anhydride and dry sodium acetate, an acetyl derivative was obtained which was not at all similar to the parent substance. The new compound was a pale yellow, viscous, sticky liquid, amounting to 122.9 per cent. of the resin from which it was derived, and resembling honey in odor and appearance. Like its parent resin, it was darkened by alkalies and attacked by bromine. It was neither crystalline, volatile nor poisonous.

An attempt was made to separate the benzin-soluble resin into two or more constituents by shaking with alcohol and petroleum benzin in immiscible proportions as follows: 25 Cc. of the resinous substance were dissolved in 300 Cc. of benzin (b. p. below 50° C.), and shaken out first with 66 per cent. alcohol in 4 portions 100 Cc., 25 Cc., 25 Cc., and 25 Cc. each; then with 85 per cent. alcohol in the same quantities and in the same order as above. On evaporation all three solvents yielded dark, amber-red fluid resins which resembled the parent substance in properties and appearance. The 66 per cent. alcoholic fraction amounted to but 15 Cc. from a 400 Cc. sample (3.75 per cent.), so that but few experiments were made with it. The other two fractions were each poisonous. The one soluble in 85 per cent. alcohol had a specific gravity of 0.9856 at 25° C./ 25° C.; the other a specific gravity of 0.9703 at 25° C./ 25° C. We are inclined to believe that no actual separation was made by this method, as each fraction yielded a black insoluble soap, together with some insoluble matter on saponification, and each gave a non-poisonous, non-volatile, acetyl derivative of similar properties. Many attempts were made to determine the saponification numbers of these products; but, as was the case with the benzin-insoluble resin, the soap solutions were too dark to determine the point of neutrality with exactness. By employing alcoholic KOH, numbers were obtained ranging from 238.7 to 321.4 for the resins, and from 459.9 to 510.0 for their acetyl derivatives. Barium hydroxide in hydro-alcoholic solution was also tried, but the results were no more satisfactory than with KOH. In this case the excess of barium hydroxide was determined gravimetrically after precipitating and filtering out the insoluble barium compound. The barium compound was bluish-gray in color, and non-poisonous.

TREATMENT WITH LEAD ACETATE.

With an alcoholic solution of lead acetate the 85 per cent. alcoholic fraction and the benzin-soluble fraction, obtained as above, each gave a flocculent light-gray precipitate, which darkened considerably on standing. By slightly modifying the method of fractional precipitation used* on the resins of Japanese lac, we have obtained several fractions from the

* "Japanese Lac." Dissertation. A. B. Stevens, p. 20, 1906.

benzin-soluble portion of the resin. All these fractions were dark, brown-red, poisonous liquids, similar in appearance to the original resin.

The method as finally adapted was as follows :

The resin was dissolved in 95 per cent. alcohol, and an alcoholic solution of lead acetate added as long as a precipitate was formed. The precipitate was filtered out, washed with alcohol, suspended in fresh alcohol and decomposed by H_2SO_4 . The excess of acid was removed by lead carbonate and the filtrate evaporated. The alcoholic filtrate from the first precipitate was treated with sulphuric acid, then with lead carbonate, filtered, evaporated to remove alcohol and shaken out with ether. Upon evaporating the ether, a dark red-brown residue was obtained, which, when dissolved, in alcohol, was readily precipitated by alcoholic lead acetate solution. This precipitate was treated like the first, and this process was repeated until no appreciable precipitate could be obtained with lead acetate solution. As these fractions were all so similar in appearance and properties we believe that no actual separation was accomplished.

Syme and Acree * state that they separated the poison of poison ivy from impurities by extracting its impure lead compounds with ether in a Soxhlet apparatus and decomposing the resultant soluble extract with hydrogen sulphide. We have attempted to separate the resins of poison sumac by this method. Lead compounds were first prepared by precipitating an alcoholic solution of the benzin-soluble, poisonous resin, with a hydro-alcoholic solution of lead acetate. The lead precipitate was washed with diluted alcohol by decantation, thrown on a filter, further washed with diluted alcohol, and finally with hot water. It was then placed in a desiccator over sulphuric acid until partially dried (twenty-four hours), and extracted with ether in a Soxhlet apparatus until the solvent came over colorless. This required about ten hours. The insoluble residue in the thimble was removed, dried in the air, and again extracted with ether. Only a trace of colored substance was removed. The insoluble substance in the thimble was then decomposed by H_2SO_4 in alcoholic suspension. A non-poisonous oil was given on evaporation of the solvent. The ether extract, which was of a deep green color in ethereal solution, was filtered and dried by immersing sticks of fused calcium chloride in its ethereal solution for twenty-four hours. On evaporation of the solvent it yielded a dark-brown, oily residue, which was poisonous, and which contained 37.7 per cent. of lead. Further experiment showed that this residue was a mixture, consisting of an oily, lead-free, poisonous substance, soluble in alcohol, and a non-poisonous, true lead compound insoluble in alcohol. The lead compound (which was present in far greater proportion), when separated from its oily congener, suspended in ether, and decomposed by hydrogen sulphide, yielded a light yellow, ill-smelling oil, which was very

* Am. Chem. J., 36, 313-5.

poisonous. It is probable that this odor was due to compounds of hydrogen sulphide with ether, rather than to any characteristic of the poisonous substance, as the resin obtained by decomposing the lead compound with sulphuric acid had no such odor, but was at the same time poisonous. Three fractions were thus obtained: that from the ether-insoluble lead compound was non-poisonous, that from the ether-soluble lead compound was poisonous, and the lead-free, oily, poisonous portion.

A considerable quantity of the poisonous resin was obtained by suspending the green ether-soluble lead compound in alcohol and decomposing it by sulphuric acid. Excess of acid was removed by lead carbonate, and the liquid after filtration evaporated under reduced pressure. This residue was of a dark amber-red color, had the characteristic sumac odor and was very poisonous. Its lead precipitate, prepared by the method given above, was found to be almost completely soluble in ether when extracted for a long time in a Soxhlet apparatus. This second ether extract resembled the first in physical properties, but when decomposed by sulphuric acid, and subsequent evaporation of the solvent, the resultant resin was found *not* to be poisonous. As this substance was no longer poisonous and lack of time prevented the preparation of a fresh quantity of the material, no further work was done upon the resins.

A number of combustions were made upon the products obtained, but the results were not always concordant, although great care was used. This, together with the great variation in the saponification numbers and the variable amounts of insoluble matter produced by saponification, would indicate that the poisonous substance is a complex mixture rather than an isolated compound.

The following results were obtained by combustion :

Portion soluble in benzin when shaken with alcohol.

I.

0.2574 Gm. gave 0.2187 Gm. H_2O and 0.7192 Gm. CO_2 .

II.

0.2747 Gm. gave 0.2344 Gm. H_2O and 0.7659 Gm. CO_2 .

I.

0.4716 Gm. gave 5.2 Cc. N at $21^\circ C.$ and 738 Mm.

II.

0.4282 Gm. gave 4.8 Cc. N at $20^\circ C.$ and 732 Mm.

	I. Per Cent.	II. Per Cent.	Mean. Per Cent.
Hydrogen.....	9.461	9.544	9.502
Carbon	76.203	76.040	76.122
Nitrogen...	1.101	1.105	1.103

Portion dissolved by 85 per cent. alcohol when shaken with benzin.

I.

0.2833 Gm. gave 0.2424 Gm. H_2O and 0.8116 Gm. CO_2 .

II.

0.2499 Gm. gave 0.2152 Gm. H_2O and 0.7182 Gm. CO_2 .

I.

0.4645 Gm. gave 5.1 Cc. N at $20.5^\circ C.$ and 743 Mm.

II.

0.4608 Gm. gave 5.2 Cc. N at $21.5^\circ C.$ and 738 Mm.

	I. Per Cent.	II. Per Cent.	Mean. Per Cent.
Hydrogen	9.571	9.632	9.601
Carbon	78.131	78.380	78.255
Nitrogen	1.104	1.124	1.114

Combustion of the acetyl derivative from the portion soluble in 85 per cent. alcohol.

I.

0.2738 Gm. gave 0.2043 Gm. H_2O and 0.7207 Gm. CO_2 .

II.

0.2609 Gm. gave 0.1923 Gm. H_2O and 0.6819 Gm. CO_2 .

I.

0.5047 Gm. gave 5.6 Cc. N at $26^\circ C.$ and 736 Mm.

II.

0.5391 Gm. gave 5.9 Cc. N at $21^\circ C.$ and 746 Mm.

	I. Per Cent.	II. Per Cent.	Mean. Per Cent.
Hydrogen	8.342	8.249	8.296
Carbon	71.787	71.363	71.575
Nitrogen	1.084	1.119	1.101

The fact that all of the portions of resin obtained by fractional precipitation with lead acetate were poisonous, and that repeated precipitation and separation destroyed the poisonous properties, indicates that the benzin-soluble substance is not a compound, but that the apparently different substances obtained are the result of oxidation. This is supported by the fact that the final lead compound, like the ether-insoluble substance, is not poisonous. The small portion of lead-free oily substance indicates that a portion of the resin was occluded by the lead precipitate, thus preventing it from coming in contact with sufficient lead acetate to precipitate it. This is supported by the fact that after separation it is easily precipitated by the lead acetate.

Several experiments were made in order to compare the latex of poison ivy with that from poison sumac. The juice was collected from the ivy

stems by a method analogous to that used for sumac. It occurs in ivy far less abundantly than in sumac, hence its collection is much more tedious. In color and consistency ivy lac resembles sumac lac very closely, but it is devoid of the peculiar sweetish odor of the latter. Qualitative tests showed that it contains a brownish-red, poisonous resin soluble in alcohol, a non-poisonous gum-enzyme insoluble in alcohol but soluble in water, and a third substance insoluble in either of these solvents.

Each of these substances possesses properties very similar to the corresponding substance in the latex of the sumac. The resin is apparently as venomous as its analogue in the sumac, but the gum-enzyme acts somewhat more slowly toward tincture of guaiac than does the sumac gum. No quantitative tests were made owing to lack of material, yet we believe that further work will show the proportions of the several ingredients of the two juices to be very similar.

THE FRUITS OF RHUS VERNIX.

The diameters of a considerable number of the fruits were measured. The values for the longer diameter lay between 4.91 Mm. and 6.23 Mm.; the shorter between 3.55 Mm. and 5.04 Mm. From these figures it will be seen that the size of the fruit varies considerably. One hundred specimens were selected at random from a large number and weighed. The stones were then removed and weighed. The following results were obtained from samples of 100 specimens each:

	I.	II.	Mean.
Fruit	2.4586	2.3836	2.4211
Stones.	1.8596	1.7967	1.8286

The stones constitute 75.527 per cent. of the weight of the fruit.

A preliminary experiment showed that the ripened fruit contained an abundance of fat. The fat-content was determined as follows:

A quantity of the fruit, previously freed from stems, was ground to a No. 20 powder. About 25 Gm. of the ground fruit were accurately weighed, placed in Scheibler desiccator over colorless sulphuric acid, and dried to constant weight. The dried residue was then transferred to a percolator provided with glass stop-cock and percolated with petroleum benzin (b. p. below 65° C.) until exhausted. The solvent was then evaporated, the residue dried at 60° C., and weighed as fat. Fruit grown in 1905, which had been stored one year, gave a mean of 4.290 per cent. of moisture, and 21.163 per cent. of fat, the latter being calculated on the undried sample as collected. Fruit grown in 1906, which had not been stored for any appreciable length of time, contained 4.951 per cent. of moisture and 19.225 per cent. of fat. No volatile oil was present in the fruits, as was shown by the fact that the desiccating acid remained colorless during the entire drying of the ground fruit. The crude fat is a hard, greenish-white solid, which has a faint,

peculiar odor, and a faint, somewhat tallow-like, rather unpleasant taste. Its specific gravity is, uncorrected, 0.9749 at 25° C./25° C. It melts at 38°–39° C. It is readily saponifiable, sap. No. 236.3, iodine No. 13.105. The crude fat is almost insoluble in cold alcohol; rather difficultly soluble in hot alcohol, from which a large proportion separates on cooling in splendid, white, crystalline flocks. After crystallizing once from benzin and twice from alcohol, the purified fat melted at 43.5° C. to 45.5° C., uncorrected. Its iodine absorption number (Hübl) is 3.39. On saponification with alcoholic potassium hydroxide the purified fat yields an excellent soap and an abundance of glycerin, 1 Gm. requiring 236.7 to 237.4 Mg. KOH.

Analysis of the purified fat gave the following results :

I.

0.2979 Gm. gave 0.3187 Gm. H₂O and 0.8173 Gm. CO₂.

II.

0.2960 Gm. gave 0.3136 Gm. H₂O and 0.8119 Gm. CO₂.

	I. Per Cent.	II. Per Cent.	Mean. Per Cent.
Hydrogen	11.966	11.851	11.908
Carbon	74.824	74.806	74.815

Eberhardt * has reported that Japan tallow consists chiefly of palmitin with small quantities of the glycerides of isobutyric and oleic acids, together with unsaponifiable matter. Geitel and van der Want † have further reported the presence of the glyceride of a dibasic fatty acid not previously described, which latter they call "Japanic acid."

Our analysis conforms more closely to myristin than to palmitin, as seen by the following :

	Found.	Calculated for Myristin.	Calculated for Palmitin.
H	11.908	11.990	12.239
C	74.815	74.724	75.861
O	13.277	13.286	11.900

Sumac tallow conforms closely in its physical and chemical properties to the published observations upon Japanese tallow. Further work may prove that the two are identical, or very similar in compositions. Owing to lack of time, we have not continued the investigation of this substance.

The alcoholic mother liquors remaining after the first crystallization of the fat were concentrated and a second deposit of nearly colorless white fats was given. The process was repeated until, after four deposits of fat had been obtained and the mother liquors had been concentrated until no

* Inaug. Diss., Strassburg, 1888.

† J. Pr. Chem., 61, 151–6.

more alcohol remained, a small quantity of a dark, brownish-yellow fluid oil remained, from which no more solid fats could be separated. A preliminary examination of the stones from the fruits showed that they contained a small amount of a fluid fat, which probably accounts for the fluid fraction in the fat from the entire fruits as obtained above. The fat in the stones was determined as follows:

A quantity of the stones (free from wormy specimens) was freed from adhering fats by carefully scraping with a pen knife and subsequent washing in petroleum benzin of low boiling-point. After drying in the air, the stones were ground to a No. 20 powder, the moisture determined by drying over colorless sulphuric acid, and the fat extracted from the dried substance by petroleum-benzin, as was the case with the entire fruit. Calculated on the air-dried sample the stones contained 5.161 per cent. of water, and 0.8489 per cent. of fat. This fat is a pale yellow, odorless, tasteless, non-poisonous, liquid oil. It is easily saponifiable and is apparently non-drying. The quantity obtained was too small to permit many determinations being made. Its iodine absorption number (Hübl) was 130, and its saponification number (one determination only) 267.7.

That the fluid fractions of the fat from the entire fruit are very largely derived from the stones rather than from the mesocarp, is shown by the following facts and experiments:

A quantity of the fruit was triturated roughly in a mortar in such a manner as not to break the stones. The mass was subjected to moderate pressure under warm water until most of the fat from the mesocarp was removed. The water was cooled, the fat collected, melted, strained and dried. Its iodine absorption number was 3.98 or nearly the same as that of the fat from the entire fruit (3.4), which had been purified by recrystallization from alcohol. The iodine number of the crude fat from the entire fruit was 13.10 and that of the fluid fat from the stones 130. Since the stones contain but 0.89 per cent. of fat (0.6 per cent. of the entire fruit), a simple calculation shows that the crude fat should contain 3.12 per cent. of the fat from the stones. With an iodine number of 130, this amount would materially increase the iodine number of a mixture, the other components of which are fats having low iodine equivalents.

No poisonous constituent could be detected in the ripened fruit. Neither starch, alkaloids nor glucosides were present, but the residues remaining after extraction of the fats with benzin were very rich in nitrogen.

Pfaff* states that he found 3.6 per cent. of crude "toxicodendrol" in the fruit of *Rhus toxicodendron*, but does not give the amount in *Rhus vernix*, though we are led to believe that he found it in the fruit of this species. He says: "It (toxicodendrol) was found in all parts of the plant—stems, branches, roots, leaves and fruits—its amount, however,

* Jour. Exp. Med. 2, 188.

varying, the fruit and leaves containing most. The oil was found in *Rhus toxicodendron* as well as *Rhus venenata*" (*Rhus vernix*). For the extraction of his "toxicodendrol" we believe that Pfaff must have employed fruit which had been collected in a green state or contaminated with other parts of the plant, for we have repeatedly examined the fully ripened fruit of both these species and have been unable to find any traces of poison in either.

As before stated, we have found 19-21 per cent. of fat in the fully ripened fruit of *Rhus vernix*, and from the mature fruit of *Rhus radicans* (deprived of their pericarps) we have obtained 33.4 per cent. of a greenish-white, solid fat, which closely resembles that from sumac fruit, but is slightly softer and less brittle. Its specific gravity is 0.9577 at 25° C. / 25° C.; saponification value, 238.55 Mg. KOH, and its iodine absorption number 30.119. When purified by one crystallization from hot alcohol it is a hard, brittle, white, solid fat, similar in appearance to that obtained by similar treatment from the crude fat of the sumac, although slightly softer and less brittle. The purified fat melts at 42° to 42.5° C. (uncorrected). Meyer* states that the wax from *Rhus toxicodendron* (*R. radicans*) melts under all conditions at 42° C., and is therefore probably a pure substance. We have found that the crude fat as extracted from the fruit is not a pure individual substance, since a single crystallization from alcohol not only yields a product that is much whiter, harder and more brittle than the crude fat, but lowers its iodine number from 30.1 to 15.8. Probably its iodine number could be lowered still further by repeated crystallizations.

The Chair stated that the paper would take the usual course, without objection, and it was so ordered.

Mr. Stevens, at request of the Chair, then presented in abstract the following paper on the estimation of camphor and alcohol in spirits of camphor :

A SIMPLE METHOD OF ESTIMATING CAMPHOR AND ALCOHOL IN SPIRIT OF CAMPHOR.

BY JAMES SEYMOUR.

The instrument used for the assay consists of a graduated tube about 2 Cm. in diameter and 15 to 20 Cm. long joined at the lower end to a smaller tube about 7.5 Mm. in diameter and about 5 to 7 Cm. long, and graduated in 0.5 Cc.

METHOD OF ASSAY.

The spirit is first examined for the per cent. of water present, by placing in the instrument about four Cc., and noting the volume exactly then add from 0.5 to 1 gram of potassium carbonate and shake a few minutes.

* Arch. d. Pharm., 25, 120.

Should the carbonate dissolve, the alcohol is below the required strength and more potassium carbonate should be added until in excess. Allow the liquids to separate and read the volume of the upper alcoholic layer. Subtract this volume from the original volume of spirit taken. This gives the volume of water present. For example if 4 Cc. were taken and the alcoholic layer occupied 3.2 Cc. $4 - 3.2 = 0.8$ and $\frac{0.8}{4} = .20$, the per cent. of water present.

ESTIMATION OF CAMPHOR.

Camphor and chloral hydrate form a liquid that is very sparingly soluble in water or 30 per cent. alcohol, and this liquid can readily be measured as it settles to the bottom of the graduated tube and when more than two per cent. of camphor is present in the spirit the amount of camphor may be estimated within an error of about $\frac{1}{10}$ of one per cent.

After determining the water present, place 10 Cc. of the sample in the tube. If deficient in alcohol add a volume of alcohol equal to that of the water found, then add two grams of chloral hydrate and when dissolved add water to 30 Cc. Shake thoroughly and allow to settle. With official spirit of camphor the chloral camphor settles, forming a clear liquid occupying a volume of 2 Cc.

When the spirit is strong of camphor it settles quicker than when weak, and with 2.5 per cent. of camphor it takes several hours; with two grams of camphor in 100 Cc. no separation takes place. The temperature should be from 15° to 20° C.

From numerous experiments the volume of chloral camphor found for various strengths of spirit are as follows:

Camphor in 100 Cc.	Chloral Camphor.
10 Gm.	2 Cc.
9 Gm.	1.75 Cc.
8 Gm.	1.50 Cc.
7 Gm.	1.25 Cc.
6 Gm.	1.00 Cc.
5 Gm.	0.75 Cc.
4 Gm.	0.50 Cc.
3 Gm.	0.25 Cc.
2 Gm.	0.00 Cc.

—*Scio College of Pharmacy.*

The Chair said the paper would take the usual course, without objection, and it was so ordered.

The next paper called for was one on "Cannabis Americana," by E. W. Houghton and H. C. Hamilton, which Mr. Houghton presented in abstract, the following being the text of the paper:

A PHARMACOLOGICAL STUDY OF CANNABIS AMERICANA (CANNABIS SATIVA).

BY E. M. HOUGHTON, PH. C., M. D., AND H. C. HAMILTON, M. S., DETROIT, MICH.

Much has been said and written by physicians and pharmacists relative to the activity of *Cannabis Sativa* (*Cannabis Indica* and *Americana*). It is generally believed that the American-grown drug is practically worthless for therapeutic purposes, and that one must employ the true *Cannabis* from India, in order to obtain physiological activity. The best quality of Indian drug, it is claimed, is that grown especially for medicinal purposes and consists of the flowering tops of the unfertilized female plants, care being taken during the growing of the drug to weed out the male plants. This notion, according to our experience, is based largely upon error, as we have found repeatedly that the Indian drug which contains large quantities of seed is fully as active as the drug which does not contain the seed, provided the seed is removed before it is percolated. The experiments are based upon a fluidextract or other pharmaceutical product obtained from an equal weight of drug minus the seed. The seeds themselves do not contain the active principle upon which the therapeutic properties of the plant depend, but may make up a very large percentage of the weight of the drug as it appears on the market.

Several years ago we began a systematic investigation of American grown hemp. Samples were obtained from the following localities and studied :

1. August, 1905, Mr. Gaumnitz, of the Department of Agriculture, of the University of Minnesota, sent us samples of hemp grown on the college grounds.

2. 1906. Also supplied by Mr. Gaumnitz.

3. Grown in Mexico, 1903. Sent in for examination.

4. Grown in Mexico, 1904.

5. Grown in Mexico, 1906.

6. Grown in Kentucky, 1905.

7. Grown in Kentucky, 1906.

8. Grown near Detroit, Mich., 1907.

From these several samples of *Cannabis Americana* were prepared fluidextracts and solid extracts according to the U. S. P., which were tested upon animals for physiological activity.

The method of assay, which has previously been called to the attention of this Society, is that which one of us (Houghton) devised and has employed for the past twelve years. This method consists essentially of the careful observation of the physiological effects produced upon dogs from the internal administration of the preparation of the drug under test. It is necessary in selecting the test animals to pick out those that are easily susceptible to the action of cannabis, since dogs as well as human beings

vary considerably in their reaction to the drug. Also, preliminary tests should be made upon the animals before they are finally selected for test purposes, in order that we may know exactly how they behave under given conditions. After the animals have been finally selected and found to respond to the standard test dose, .010 Gm. per kilo, they are set aside for this particular work, care being taken to have them well fed, well housed, and in every way kept under the best sanitary conditions. Usually we have found it desirable to keep two or more of the approved animals on hand at all times, so there may not be delay in testing samples as they come in.

In applying the test, the standard dose is administered internally in a small capsule. The dog's tongue is drawn forward between the teeth with the left hand and the capsule placed on the back part of the tongue with the right hand. The tongue is then quickly released and the capsule swallowed with ease. In order that the drug may be rapidly absorbed food should be withheld 24 hours before the test and an efficient cathartic given, if needed.

Within a comparatively short time, one or two hours, the dog begins to show the characteristic effects of the drug: first, a stage of excitability is noticed, followed sooner or later by a condition of incoördination, the animal behaving as though intoxicated. Experience is necessary on the part of the observer to determine just when the physiological effects of the drug begin to manifest themselves, as there is always, as in the case of many chemical tests, a personal factor to be guarded against. The dogs must be kept perfectly quiet and watched without attracting attention. The influence of the test dose on the unknown drug is carefully compared with the same dose of the standard preparation administered to another test dog at the same time, under the same conditions. Finally, the dogs become sleepy, the observations are recorded and the animals returned to their quarters.

The second day following, the two dogs are reversed, *i. e.*, the animal receiving the test dose of the unknown receives the test dose of the known and *vice versa*, and a second observation made. If one desires to make a very accurate quantitative determination it is advisable to use not two dogs but four or five, and study the effects of the test dose of the unknown in comparison with the test dose of the known. If the unknown is below standard activity the amount should be increased until the effect produced is the same as for test dose of standard. If the unknown is above strength the test dose is diminished accordingly. From the dose of the unknown selected as producing the same action as the test dose of the standard the amount of dilution or concentration necessary is determined. The degree of accuracy with which the test is carried out will depend largely upon the experience and care exercised by the observer.

It is best to use the dogs on alternate days, in order that they may completely recover from the influence of the drug. Another point to be

noted in the use of dogs for standardizing cannabis is that, although they never appear to lose their susceptibility to the drug, the same dogs cannot be used indefinitely for accurate testing. After a time they become so accustomed to the effects of the drug that they refuse to stand on their feet, and so do not show the typical incoördination which is the most characteristic and constant action of the drug.

We have never been able to give an animal a sufficient quantity of a U. S. P. or other preparation of the drug to produce death. When study of the drug was first commenced, careful search of the literature on the subject was made to determine its toxicity. Not a single case of fatal poisoning have we been able to find reported, although often alarming symptoms may occur. A dog weighing about 25 pounds received an injection of two ounces of an active U. S. P. fluidextract in the jugular vein, with the expectation that it would certainly be sufficient to kill the animal. To our surprise the animal, after being unconscious for about a day and a half, recovered completely. This dog received not alone the active constituents of the drug, but also the amount of alcohol contained in the fluidextract. Another dog received about 7 Gm. of solid extract of cannabis with the same result.

There is some variation in the amount of extractive obtained, as would be expected from the varying amount of stems, seeds, etc., in different samples. Likewise there has been a certain amount of variation in the physiological action, but in every case there have been elicited the characteristic symptoms from the administration of .010 Gm. per kilo body-weight of the extract.

The repeated tests that we have made convinced us that the drug properly grown and cured is fully as active as the best Indian cannabis, which we have sometimes found to be practically inert. Previous to the adoption of the physiological test over twelve years ago, we were often annoyed by complaints of physicians that certain lots of drugs were inert, in fact some hospitals, before accepting their supplies of hemp preparations, asked for samples in order to make rough tests upon their patients before ordering. Since the adoption of the test we have had not a single report of inactivity, although many tons of the various preparations of *Cannabis Indica* have been tested and supplied for medicinal purposes.

Furthermore, we have placed out quantities of fluidextract and solid extract of *Cannabis Americana* in the hands of experienced clinicians, and from eight of these men, who are all large users of the drug, we have received reports which state that they are unable to determine any therapeutic difference between the *Cannabis Americana* and the *Cannabis Indica*. We are of the opinion that *Cannabis Americana* will be found equally as good and perhaps better than that obtained from foreign sources, as proper directions can be given to the grower, in order to produce drug of the greatest value. We expect to give this phase of the subject especial

attention during the next few years, and see what improvements may be effected.

Mr. Searby wanted to know of Mr. Houghton whether the plants described were all grown in parts of the country where, for a large portion of the year, the weather was warm, and Mr. Houghton replied that two of the samples were grown in Minnesota, three in Kentucky, three in Arkansas and one in Michigan, and that the variation was no greater—in fact, it was less—than that observed in the imported drug.

The paper was received and referred to take the usual course.

The Chair called for a paper by Mr. Scoville on "Oil of Hamamelis," which Mr. Scoville presented in abstract, the following being the text of his paper :

OIL OF HAMAMELIS VIRGINIANA.

BY WILBUR L. SCOVILLE.

In the distillation of witch-hazel twigs on a large scale, a small quantity of a green, fatty substance, having a strong odor of witch-hazel, rises to the surface of the distillate. This has long been regarded by the distillers as the oil of witch-hazel, and the active ingredient of the distillate. Through the courtesy of Mr. E. E. Dickinson, of Essex, Conn., a sufficient quantity of this "oil" was obtained for a partial examination.

The "oil" as received has much the same appearance as a soft grease, occluding water. It has a greenish color and a strong odor.

This was distilled with water, the same water being returned repeatedly to the still, until the distillate dropped nearly clear. The oil which was obtained in this way came over very slowly, had a yellowish color, and a strong odor, recalling that of aqua hamamelidis, but differing from it in the quality of the odor. The resemblance is, however, close enough to ascribe the odor of aqua hamamelidis to this or a similar oil.

The difference in odor suggests that, as in the case of rose distillates, there is some constituent in the natural oil which is more soluble in water than in the remaining constituents of the oil, and which remaining in the water imparts its odor thereto.

Two samples of this oil were obtained from different lots of the grease. These showed the following characteristics :

Specific gravity, at 25° C., 0.8984 and 0.8985.

Refractive index, at 20° C., 1.4830 and 1.4892.

Optical rotation, +4.6 and +5.05.

Saponification equivalent, 3.80.

Saponification equivalent, after acetylation, 30.3.

The greater portion of the oil distilled between 250° C. and 263° C. Ten volumes of official alcohol were required for solution at 25° C.

The oil evidently consists chiefly of a terpene, with a small proportion

of an alcohol (about 7 per cent.), and a still smaller amount of an ester. The characters of the ester and alcohol were not determined.

The variations in the first constants may, perhaps, be ascribed to variations in the oils, due to incomplete separation from the waxy matters. The mixture in the still had a strong tendency to froth, and the separation of the oil was tedious. Undoubtedly the separation was more nearly complete in one case than in the other, but was not complete in either case.

The non-volatile portion remaining in the still consisted of a dark-green, waxy substance, which still possessed a strong odor. The oil separated so slowly from this that at no time in the distillation were oil globules distinctly visible in the drops falling from the condenser, though they were markedly turbid.

The wax constituted about 72 per cent. of the original grease, exclusive of occluded water. It breaks with a granular fracture, similar to beeswax, and is quite firm. The sample examined melted at 37° C., and had a refractive index of 1.4450 at 60° C. Its saponification equivalent was found to be 54.3, and the iodine number 73.6. Its color appears to be due to chlorophyll.

Samples of the three substances are submitted.

Mr. Hallberg said he was exceedingly glad Mr. Scoville had presented this subject here, because it was so often stated that there was no virtue in witch hazel, except the alcohol it contained. He had always felt that it had astringent and possibly some other properties of a valuable nature.

The paper was then received and referred for publication.

The Chair called for an abstract of a paper on the "Synthesis of Adrenalin," by Mr. J. L. Turner, and the author presented the subject, as follows:

PROGRESS IN THE SYNTHESIS OF ADRENALIN.

BY JOSEPH L. TURNER.

The history of the discovery of Adrenalin is at present quite generally known, and it would be useless for me to indulge in repeating it. I would like at this point to state the following facts only:

When an active principle of a natural body is discovered, its discoverer assigns to it a name, which generally becomes terminus technicus for this principle. Not so with the active principle of the suprarenal capsule. Takamine, who isolated the principle in crystalline form, christened it Adrenalin, and you would expect that the subsequent investigations of this body would be referred to as "investigations of adrenalin." In the scientific literature of the past few years, however, you will find articles on "Epinephrin," "Suprarenin," "Adrenalin," "Active Principles of the Suprarenal Capsule," and what not. While admitting that trade-marks are a necessity for the successful pursuit of dealing in pharmaceuticals, I think that trade-names should be barred from the scientific literature,

because a practice of this kind brings confusion into the literature. For that reason, no matter under what name adrenalin may be known commercially, scientifically it should be only "adrenalin."

As stated in the beginning of my paper, the history of the discovery of adrenalin is generally known; not so with the knowledge of the work on establishing its chemical constitution. Publications, pertaining to this side of this question, appeared either in the medical or chemical press of four different countries, and naturally they are widely scattered. The pharmaceutical press does not possess, so far, any coherent account of the research on this body, which at present occupies a position of eminent importance in medicine.

There is not much to be said about the research on the active principle of the suprarenal gland up to the year 1897, when a publication by Abel and Crawford on the subject in question appeared. Up to this time it was only established that the extract of the suprarenal gland possessed reactions similar to those of pyrocatechol; and Fraenkel went even so far as to pronounce the body, which he isolated from the extract and called "sphygmogenin," to be "a nitrogenous derivative of the dihydroxy-benzene series." In the article referred to, Abel and Crawford showed that the active principle, or rather, what they thought to be the active principle, may be precipitated from the aqueous extract of the gland with benzoyl chloride and sodium hydroxide. This benzoyl compound may be decomposed with hot dilute sulphuric acid, but as they stated themselves, they were not yet dealing with a pure substance, and in a subsequent article published in the Johns Hopkins Hospital "Bulletin," September, 1898, they announced that they had succeeded in separating the active principle of the suprarenal capsule in the form of a powder of a light gray, brownish color, whose percentage composition is expressed by the formula $C_{17}H_{15}NO_4$.

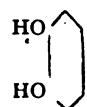
v. Fuerth, working simultaneously with the above investigators isolated the impure acetylated derivative, analysis of which led him to assign to the active principle the formula $C_8H_9NO_2$, or $C_8H_7NO_2$. However, neither Abel and Crawford nor v. Fuerth were dealing with the active principle, and only after Takamine isolated the adrenalin, Aldrich was able to propose for it the formula $C_8H_{13}NO_3$. This was confirmed upon careful analysis by v. Fuerth, Bertrand, Pauly, Jowett and others.

Very soon after adrenalin was successfully isolated, work on the determination of its chemical structure began.

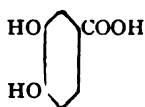
Observations of previous investigators showed that the extract of the suprarenal gland possessed the reactions of pyrocatechol, and in fact Takamine obtained the latter, together with protocathechuic acid, by fusing the pure active principle with potassium hydroxide; v. Fuerth confirmed these results and stated that adrenalin contained a methyl-imido group, and also probably three hydroxyl groups, one of which is linked outside of

the benzene ring. On account of this fact, v. Fuerth proposed the cyclic

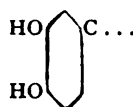
atom complex, $C_6H_5-\begin{matrix} OH \\ \diagup \\ C \\ \diagdown \\ OH \end{matrix}$ as a basis for the adrenalin molecule.



Pyrocatechol.



Protocatechuic acid.

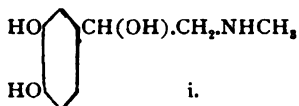


Basis of the adrenalin molecule.

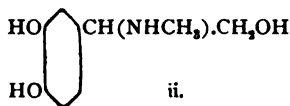
As another part of the adrenalin molecule, v. Fuerth recognized the methyl-imido group, $CH_3.NH-$, on account of adrenalin splitting off the methyl-amine, and also by means of Herzig & Meyer's method.

To this Pauly added his observation of the optical activity of adrenalin (lævorotatory), an observation very important for an explanation of the chemical constitution of a body. Thus the conclusion was at hand that one of the two carbon atoms remaining after subtraction of the six carbon atoms of the benzene ring, and of the carbon atom of the methyl-imido group, must be of asymmetric nature; *i. e.*, it must be linked with its four valences with four different atoms or atom groups.

Taking all these facts into consideration, Pauly proposed the two possible formulas for adrenalin:



i.

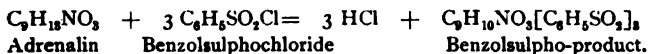


ii.

Jowett showed more inclination for the formula 1, because it explained the reactions of adrenalin by oxidation with permanganate, and by decomposition with acids and alkalis; and also explained very well the formation of pyrrol and skatol derivatives, while the second formula would not do it so readily. In a subsequent publication Pauly defended the second formula, arguing that the formation of pyrrol can be explained just as readily in the formula 2 as in the formula 1; and that the formation of skatol was observed only on decomposition of the benzoyl derivative of adrenalin. The argument was settled brilliantly by Friedmann in favor of formula 1.

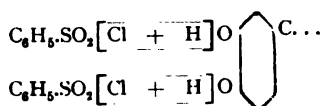
Friedmann's argumentation follows:

He begins with the tribenzolsulpho-adrenalin, produced by v. Fuerth by means of shaking the adrenalin with benzolsulphochloride in alkaline solution.

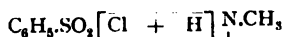


This substitution product is, unlike adrenalin, insoluble in acids and alkalis. This behavior is explained by Friedmann in the following way:

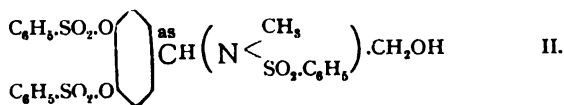
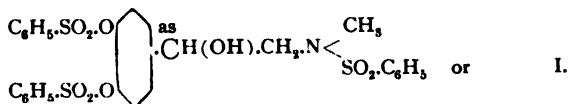
1. The product is insoluble in alkalies, because two benzolsulpho groups substituted the hydrogen of the phenolic hydroxyls.



2. The product is insoluble in acids, because the third sulpho group substituted the free hydrogen on the nitrogen atom of the methyl-imido group.



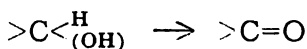
Taking the two formulas proposed by Pauly, the constitution of tribenzolsulpho-adrenalin must be either



Both of the combinations contain the asymmetric carbon atom, and the aliphatic hydroxyl group in unchanged state. Now, if the constitution of tribenzolsulpho-adrenalin corresponds with any of the above formulas, it must be still optically active, and capable of acetylation. Both suppositions could be proved by experiments: the sulpho-product is, just as adrenalin, lævorotatory, and forms with nitrobenzoyl-chloride, a crystalline derivative.

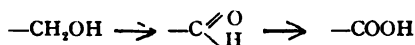


Thus, the possibilities of both of Pauly's formulas are proved. It remains to prove which of the formulas is the correct one. In the formula 1, the alcoholic hydroxyl group is of a secondary nature, and is linked to the asymmetric carbon atom. Therefore the body must form on oxidation a ketone, namely, an optically inactive ketone, because the asymmetry of this carbon atom is thereby destroyed.

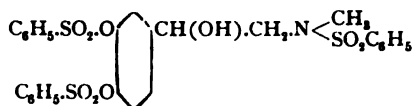


In the formula 2 the alcoholic hydroxyl group is of a primary nature; the body must therefore form on oxidation an aldehyde, and further an acid with the same number of carbon atoms, both (aldehyde and acid)

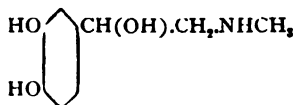
optically active, because in this case the asymmetric carbon atom is not influenced by oxidation at all.



After careful and trying experiments, Friedmann succeeded in isolating the oxidation product: Tribenzolsulpho-adrenalon; this is optically inactive, does not contain any more hydroxyl groups which could be substituted by nitrobenzoyl-chloride; forms a crystalline nitro-phenyl-hydrazone (a characteristic reaction for ketones in general), and cannot be oxidized any further to an acid with the same number of carbon atoms. Therefore the secondary hydroxyl group was changed into the carbonyl group, and the formula of the tribenzolsulpho-adrenalin must be

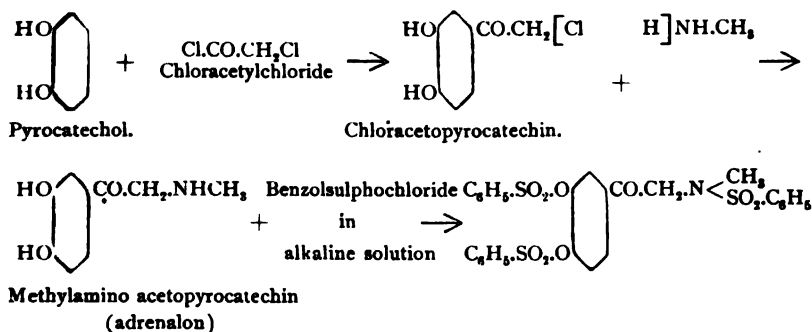


and, as it was formed from the tribenzolsulpho-adrenalin of the configuration 1, it therefore follows that the constitutional formula of adrenalin is

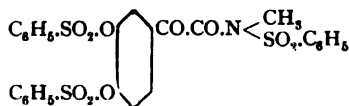


and its chemical name is dioxypheyl-æthanol-methylamine.

The correctness of the above conclusions was further proved by Freidmann by producing a synthetic tribenzolsulpho-adrenalon.



This synthetic product is perfectly identical with a similar derivative produced from the natural adrenalin, and, furthermore, the oxidation products of both the tribenzolsulpho-per-adrenalon

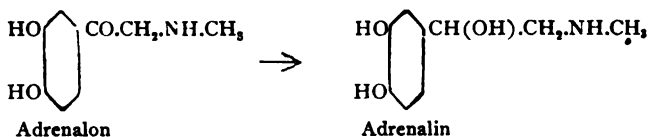


are likewise identical.

Independently from Friedmann, the question of chemical structure of adrenalin was answered by Stolz. From results of his research on adrenalin, he came to the conclusion, just the same as Pauly, that two possible formulas could be assigned to adrenalin; but he proceeded differently from Friedman in proving which of the formulas was the correct one. He simply synthesized products according to both of the formulas. The product which he obtained, trying to synthesize the body after the formula 2, did not have any blood-raising action whatsoever. Although the body which he obtained contains, instead of a methylamino group an amino group, this fact is of no great importance as to its physiologic activity as we will be able to see later on. The basis was obtained through the reduction of the oxim of the ortho-dioxy-benzoyl-carbinol $(\text{HO})_2\text{C}_6\text{H}_3\text{CO.CH}_2\text{OH}$.

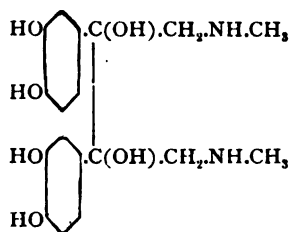
This carbinol can be obtained from chloraceto-pyrocatechin by replacing in any known way the chlorine atom by an OH group. (Aldrich made an attempt to build up a similar body and as he announced, he obtained products which qualitatively showed the same reaction as adrenalin in its blood-raising property, but he never reported any definite results on this question.)

Having failed to obtain a body similar in its properties to the adrenalin in working after the formula 2, Stolz proceeded to build up bodies in accordance with the formula 1. He obtained adrenalon in the same way as Friedmann, and the pharmacologic examination of the body showed that he was on the right track, as the methyl-amino-aceto-pyrocatechin showed exactly the same physiologic action as adrenalin, but only in smaller degree (1 part of adrenalin is equal physiologically to about 100 parts of adrenalon). As it is evident from the formula, it needs but one reaction more to accomplish the synthesis of adrenalin, i. e., to convert the keto group into a secondary alcoholic group.



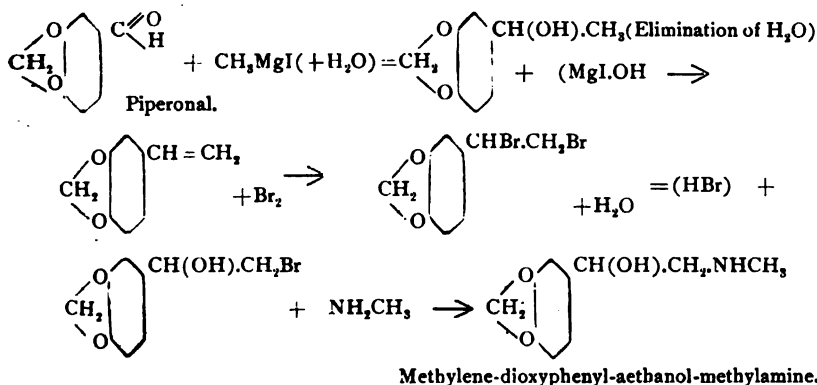
Stolz succeeded in this last step, and as he announced at the meeting of the Deutsche Naturforscher und Aertze, in September, 1906, he succeeded in isolating the pure synthetic base. The publication of his method would be of exceeding interest from a scientific point of view, because, as it is known, it is very difficult to obtain by reduction of a

mixed aromatic-aliphatic ketone only the alcohol desired and nothing else. Together with the alcohol, practically under all possible conditions of reduction, pinakons are obtained by the union of two molecules of the alcohol to be obtained, with elimination of two hydrogen atoms on the aliphatic hydroxyl group.



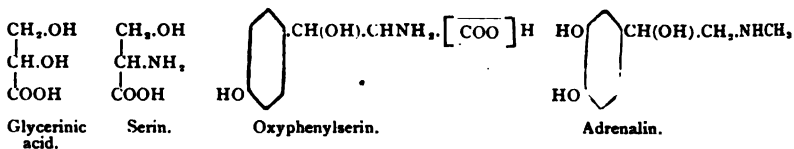
At the same time, it is very seldom possible in performing a reaction in organic chemistry, to obtain quantitative results. It is practically always the case that at the end of the reaction there remains some of the original material, and also products of some undesired reaction are obtained. In the case of synthetic adrenalin, produced in the above way, we will have to deal with two products, the ketone and the pinakone, both of which in their behavior are very closely allied to adrenalin, and therefore their separation can be accomplished only under great difficulties; it would be very interesting for all of us to know how Stolz succeeded in overcoming the obstacles as outlined above. The synthetic adrenalon does not differ physiologically from the natural, while it differs chemically in that respect that it is optically inactive.

Barger and Jowett tried to follow another way for synthesizing the adrenalin. They were not able, however, to synthesize dioxypheyl-aethanol-methylamine, but were successful in obtaining its methylene and dimethyl ethers. Both of the substances showed, qualitatively, in a small degree, the same properties as adrenalin. The stages of the synthesis they performed may be represented in the case of piperonal as follows:



At present the research on adrenalin is by no means accomplished, although brilliant results could be recorded, as far as it is seen from my short sketch above. Many bodies allied to adrenalin can yet be produced, and after pharmacologic examination of them, we may come across some synthetic bodies, possibly possessing properties which will make them more valuable than adrenalin. I would like to recall, in this connection, the natural methyl ether of morphine, codeine, and also its synthetic ethyl ether, dionin—both of which possess advantages over morphine. In the case of adrenalin, the simplest homologue body is the demethylated adrenalin. According to Fraenkel, the substitution of a hydrogen atom of the amino group by an alkyl, results very often in the increased toxicity of the body. Going on the supposition that the elimination of the methyl radical into the amino group of the adrenalin, will result in the lesser toxicity of the drug, I have succeeded in collaboration with C. E. Vanderklee in accomplishing a synthesis along lines entirely different from any of the ones mentioned above. The body so obtained is not less active than the adrenalin, isolated from the suprarenal capsule, but is less toxic, according to the experiments of Belerfeld. We hope in a short time to have the results of our research in such a shape as to make it available for publication.

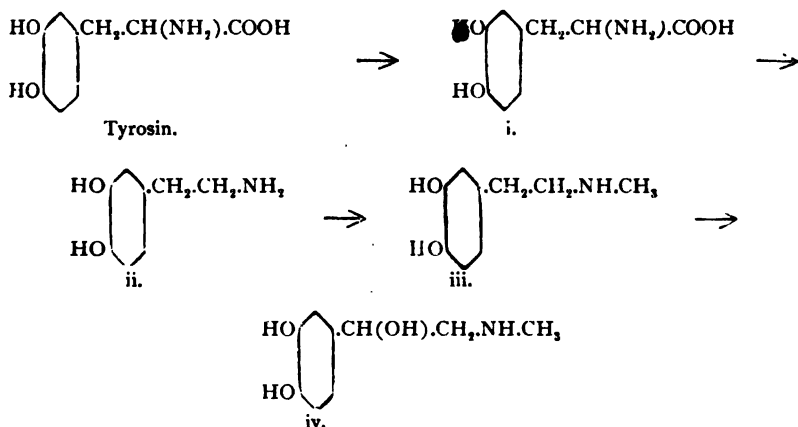
Very interesting from a theoretical point of view would be the study of the formation of adrenalin in the animal organism. No doubt the starting point is in any case the proteid. It will be interesting to conduct some research, having in view the isolation from the suprarenal gland of some of the decomposition products of the proteid molecule, from which the adrenalin molecule could be built up. Friedmann thinks that it is possible that oxyphenylserin is one of these bodies.



As is evident from the formulas it needs only an oxidation to a dioxy body, a methylation of the imido group, and a fermentative splitting-off of the CO_2 in order to produce the adrenalin—all reactions very easy to be accomplished in an animal organism.

On the other hand, W. L. Halle thinks that the starting material for the producing of the adrenalin in an animal body, can be in the first place tyrosin and phenylalanin. The formation of adrenalin from tyrosin can be imagined as a combination of four new chemical processes: 1) oxidation, *i. e.*, the introduction into the benzene molecules of a second hydroxyl group. 2) Splitting off of CO_2 in order to produce from the ortho-dioxyphenyl-alpha-aminopropionic acid the ortho-dioxyphenyl-ethylamine. 3)

Methylation on the nitrogen atom; and, 4) oxidation with introduction of a hydroxyl group into the aliphatic side chain.



Halle proved his supposition experimentally by digesting the finally dis-integrated suprarenal glands with tyrosin and normal salt solution, for six days at 37°C . In two of the four experiments, he was able to observe an increase in the amount of adrenalin while in the control experiments no such increase occurred. However, very much work yet has to be done in order to settle the question.

In conclusion, I would like to say that the discovery of adrenalin, soon followed by the establishment of its chemical formula (empirical, as well as constitutional), and finally succeeded by its synthesis, (the most important part of the work being done in laboratories of manufacturing houses) shows once more that commercial stimulus, properly directed, can be productive of results in pharmacy and medicine, as in any other art, results just as important to humanity as if the work were done in the interests of pure science.

Philadelphia, September, 1907.

There was no discussion of this paper, and it was received and referred for publication.

The Chair called for two papers by Mr. Dohme, one on the synthesis of camphor and the other on the production of camphor, and Mr. Dohme presented verbal abstracts, the texts of the papers being as follows:

THE SYNTHESIS OF CAMPHOR.

BY A. R. L. DOHME, PH. D.

It has always been a favorite topic for chemists' energy and brains to evolve syntheses of substances that are used largely in commerce, not only because of the glory attaching to the benefit to humanity of such an achievement, but also because of the monetary value of the discovery to

the discoverer. When in addition to its being commercially important, a substance is obtainable only to a limited extent in nature, there exists at once a double incentive to synthesize it. In the case of camphor there are three reasons why a synthesis is desirable.

1. Because its supply does not equal the demand.
2. Because one country controls a monopoly of the entire natural supply, and is shrewd enough to make the world pay for this monopoly.
3. Because it can be made from a substance which is both cheap and can be had in unlimited quantities.

It was my good fortune to become intimately acquainted, and to be able to work by the side of, and under the direction of the discoverer of the best synthesis of camphor; best because it yields theoretical results, a practically C. P. product, and produces it at a price that compares with what natural camphor can be brought to market for, even in a country like Japan, where labor costs next to nothing. This remarkable man to whom I have referred is Prof. Auguste Behal, Professor of Chemistry and Toxicology at the Ecole Supérieure de Pharmacie de Paris of the University of France, and general secretary of the French Chemical Society. I have worked with, and seen work, many great chemists, but I never had the pleasure before of working with a man that possessed the capacity for work that Prof. Behal possesses. He is a chemist who works and does not leave the work to his assistants. He has plenty of the latter about, and they all work diligently, but despite this he appears at the laboratory at 8 a. m., puts on his overalls, as all French chemists do, and gets to work with brain, eye and hand promptly, keeping it up at a pace until 6 p. m. that would put to shame any of our American hustlers in any line. He has a constitution of iron and a strength to match it, and is withal as genial as any savant I have ever met. For six weeks I worked with this great genius, and when I parted with him it was with the keenest regret, for his energy, enthusiasm and wonderful powers of observation and practical knowledge of how to work, was most contagious. I know of nothing so delightful to a scientifically trained mind as to rub up against and work along with a man like Prof. Behal. It gave me a true insight of what must have been the feelings and joys of a coterie of men who worked with the great Liebig at Giessen in the early days of chemical science. Behal is a born synthesizer, and most of the synthetic perfumes of which France practically has a monopoly, emanated from the brain and brawn of this chemical Colossus. With him I went through the complete synthesis of camphor, doing several complete syntheses with American, French and Russian oil of turpentine myself from beginning to end.

Here let me digress for a moment to point out where France is ahead of other countries in chemistry, and why it is time for the chemists of this country to wake up and spend some of their time at least in teaching and practicing practical or technical chemistry, and not devote all of their time

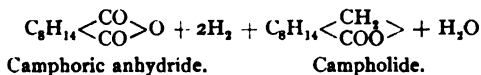
to didactic chemistry. Our chemical laboratories are bent on turning out teachers; French laboratories are bent on turning out practical, technical chemists, who, instead of debating and quibbling as to whether there is a single, double or triple bond, or an asymmetric carbon atom in a certain instance, spend their time in trying to evolve methods to help out the industries and wants of man. This is not only more creditable and laudable, but besides immeasurably more lucrative. The French chemists are and have been busy with problems which have been mapped out for them, and which involve the synthesis of such substances as the world needs, either because nature's supply is inadequate or because the cost is so high as to make it prohibitive to use them.

To return to camphor. The world's supply is drawn from Japan, who now owns the island of Formosa, and we all know that instead of a normal price of 50 to 60 cents a pound, Japan has been advancing the price to \$1.25, or more, per pound. This makes it impossible, practically, to develop the celluloid industry, for at such prices for camphor, celluloid becomes too expensive for its usual purposes. Besides this, no celluloid manufacturer can obtain nearly as much as he could or would use.

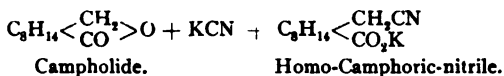
SYNTHESES OF CAMPHOR.

The early work in this line is only of theoretical interest, as there was no need for camphor in those days beyond what nature easily provided.

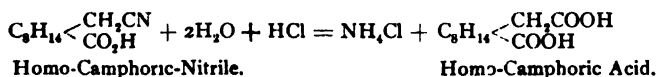
Berthelot, in 1874, obtained camphor as the result of the action of sulphuric acid on oil of turpentine. He was also the first to obtain camphor by the oxidation of camphene, and Ribau also obtained camphor by oxidizing camphene by means of the chromic acid mixture. Armstrong and Tilden subsequently also obtained camphor by the oxidation of camphene with chromic acid. Haller completed a rather complex synthesis of camphor, and one that has only a scientific value. He heated camphoric acid with acetyl chloride and obtained camphoric anhydride. By treating this with sodium amalgam he obtained its lactone campholide—



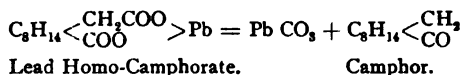
On heating campholide with potassium cyanide, he obtained homocamphoric nitrile—



On hydrolizing this, he obtained homocamphoric acid.

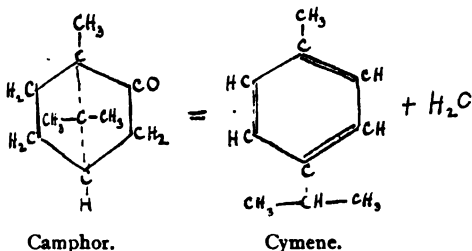


The latter acid he converted into its lead salt and on heating it obtained camphor—

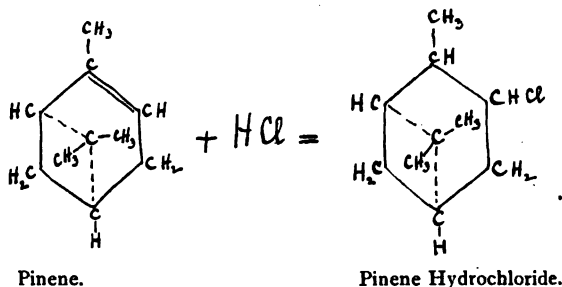


None of these syntheses, however, possessed other than a scientific value as the yield was very small, and they only served to aid in throwing light upon the constitution of camphor and the terpenes.

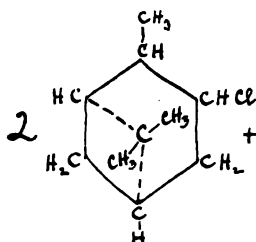
The first synthesis of any moment commercially was that of Oskar Nagel, obtained in 1897, and now employed by a large German factory, which has for some years been producing synthetic camphor on a large scale and at a good profit. The process while it yields camphor does not yield a pure camphor, as it is often mixed with cymene, which gives it a peculiar odor. The cymene is the result of the action of dehydrating agents on camphor as shown in formulas



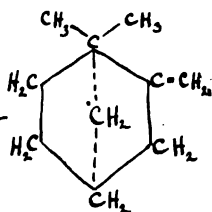
As in all syntheses of camphor Nagel begins with oil of turpentine, or to be more specific, with pinene, and by means of dry hydrochloric acid he converts it into its hydrochloric acid addition product, a crystalline substance (formerly called and sold as artificial camphor but of no value).



The pinene hydrochloride is then transformed by distilling it with lime into calcium chloride and camphene, a substance isomeric with but structurally different from pinene. Just what is the structure of camphene is not certain and it is not established that it is a true terpene. It is more stable than pinene. The reaction is

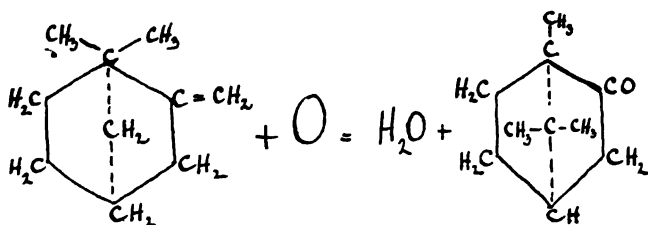


Pinene Hydrochloride.



Camphene.

By now oxidizing camphene with nitric acid, a molecular rearrangement takes place, just as one took place when camphene was produced out of pinene and besides this an oxidation, with the result that camphor is produced, viz. :



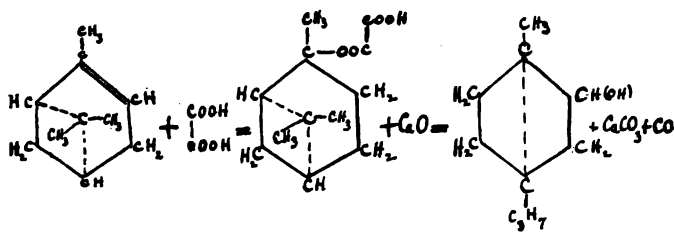
Camphene.

Camphor.

Before this process was actually commercially applied, another entirely distinct synthesis of camphor was patented in this country by Nathaniel Thurlow, of Newark, and it was operated on a large scale by the Portchester Chemical Company, of New York. The patent was issued in 1902 and the plant operated in 1903 and 1904. It was not a success and could neither produce pure camphor, nor was the process a success commercially.

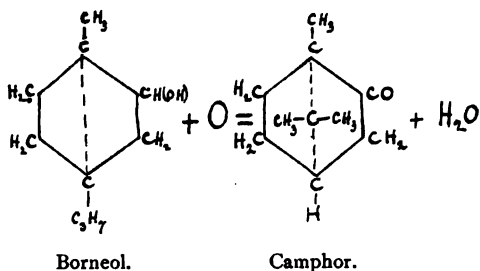
Thurlow treated pinene with anhydrous oxalic acid and obtained pinyl oxalate as he called it, and this pinyl oxalate was distilled over lime and converted into borneol, which was oxidized to camphor. The trouble in this process is that there are too many side reactions, and too many different substances are formed which so complicate the end product and the running of the process that to get out a pure final product, or a good yield, is too much a matter of uncertainty, and of time and labor.

Below follow the reactions as given by Thurlow :



Pinene. Oxalic acid. Pinyl oxalate.

Borneol.



Besides the pinyl oxalate, pinyl formate is also formed, due to formation of formic acid from oxalic acid. This pinyl formate also, however, yields borneol when treated with lime, and hence also only helps along the yield, but the complication introduced by all these reactions made the process unsuccessful.

The Behal process possesses distinct advantages over both of these by yielding in the first place, theoretical results at all stages, and pure products as well. Besides this, it is not complicated by side reactions or side products.

Behal converts the pinene into its hydrochloride, and converts this into borneol by means of lead acetate, and then converts the borneol into camphor by oxidation.

By means of this process properly carried out, there is obtained a camphor which the best experts of the world, in this country and in Europe, have pronounced to be chemically pure, and which differs from the natural Formosa camphor only in being like all synthetic products optically inactive.

I am pleased to exhibit herewith a sample of this Behal camphor, which I made myself in his laboratory, as part of a lot of ten-pounds carried through at one time, being about as much as a laboratory apparatus can handle.

Many new processes are coming to the surface daily, but they are only new in using some modification in one or more styles of the process, and are based on either the camphene process of Nagel or the borneol process of Behal.

THE PRODUCTION OF CAMPHOR.

BY A. R. L. DOHME.

It may be interesting in connection with the paper on the synthesis of camphor to have some data as to the present source of its supply and the outlook for the maintenance of the same. All camphor used in the world is supplied by Japan and China, and about in the proportion of 80 per cent. from Japan and 20 per cent. from China. Of the 80 per cent. from Japan, 70 per cent. comes from the Island of Formosa and 10 per cent.

from Japan itself. Formosa is like the ever-vexed Philippines, a land flowing with camphor and with savages, and unfortunately these two are incompatible and render most of the valuable camphor forests unprofitable, and this will continue until the Japanese government sinks a few hundred million in pacifying the natives or civilizing them. This will hardly interest the present generation much, however, in all probability, as civilization is a tedious process.

In the process of making camphor, the trees are destroyed, as the wood is actually destroyed, as is sandalwood, to get oil of santal, or cascara trees to obtain cascara bark. The result of this is that the Japanese and Chinese governments being largely debtor nations, begin to realize that they are chopping away a valuable asset when they try to increase the output of camphor while the price is up. The well-known maxim applies splendidly: "Make hay while the sun shines." To meet this self-immolation of interests, both countries have passed laws compelling the planting of young camphor trees, China being more radical than Japan in this particular, as for every camphor tree that is cut down, five new ones must be planted.

Japan planted three million young trees since 1900, to which are to be added half a million planted this year, and hereafter annually 750,000 a year. They have also established camphor experiment stations over the island, the purpose of which is to care for the young plants, collect the seed, and replant same, studying conditions of soil best suited for the plant. The climate of the half of Formosa where camphor trees abound is very unhealthy, as about 33 per cent. of the coolies who have braved the savages to gather camphor wood, have died of fever or been rendered useless for work. Quite a few have been butchered by the savages, and it is quite difficult now to get labor to go into the forests and brave the trio of dangers—beasts, fever and savages.

To still further handicap the output, Japan has passed a law limiting the destruction of camphor trees on Formosa to those in excess of fifty years old. It is estimated that this law will exterminate the available trees that comply with the law in fifty years. In the Daito section of the island about 40,000,000 pounds of crude camphor is estimated to be still in sight. At present they are operating mainly in the Toen section, and in 1907 Japan hopes to bring to market about 7,000,000 pounds of crude camphor and about half this amount of camphor oil.

There are two kinds of trees that are gathered by the natives, one yields camphor mainly, and the other mainly oil of camphor. It is planned to let the trees planted on the mountains stand fifty years before chopping them down, while those planted in the valleys are to be immolated after ten years.

At Taihoku on Formosa all the crude camphor distilled on the island by the natives, is gathered together and redistilled so as to obtain a uniform product for export. They make two varieties, one "B," mainly

exported to the United States as crude camphor, is richer in camphor oil and water, while the other "B B" more nearly approximates refined camphor. Everybody has been getting "B" camphor for sometime as the "B B" refining plant burned down. Whatever is not exported as crude, is sent to Kobe in Japan, where it is refined and exported as Japanese refined camphor.

Japan fears no competition in camphor, so she says, notably not from China or Florida, Mexico, Ceylon, or Texas. She also thinks synthetic camphor is an idle dream, although she has used her legations and consuls to endeavor to uncover how it is made and catch some one unprepared. She maintains that turpentine will give out as soon as camphor. It will unless our Uncle Samuel puts an end to the ruthless destruction of pine trees in this country, and either prevents their destruction or compels every turpentine hunting cracker to plant five trees for every one he cuts down.

In China the refineries are at Foochow, where about twenty are busy making camphor. In order to protect the camphor forests, which were being exterminated, just as are our turpentine forests, the Viceroy of Foochow has placed a tax of 76 cents on every 100 pounds of camphor made, and 28 cents on every 100 pounds of camphor oil. This money he is supposed to use to replant and care for young trees. In 1906 China produced 1,516,600 pounds of camphor, and 425,000 pounds of camphor oil.

Japan and China together produce about ten million pounds of camphor, of which $2\frac{1}{4}$ million is said to be exported to Germany. The "B" quality of crude camphor brings about 53 cents a pound f. o. b. New York. The Japanese government pays only about 12 cents a pound for what they buy from the gatherers and distillers.

Of the camphor produced, about 70 per cent. is used for celluloid, and the prices which celluloid manufacturers must pay the Japanese monopoly, whose selling agents are in London, are controlled by the latter, and also the exact amount they may get. In other words, the amount of celluloid any celluloid maker can make depends upon the amount of influence he can bring to bear upon the selling agents of camphor to favor him at the expense of his competitors.

The only synthetic camphor so far commercially on the market is that produced by Schering in Germany, and of this quite a quantity comes to this country. It sells at about the same price as the natural camphor. The British Camphor Company of London is operating the Behal process with success, but they have not yet had time to develop their plant to the same extent as has Schering, as he has been at it for several years.

It is a question of a few years only when there will be produced as much artificial camphor as there is natural now consumed, for the output is only limited by the amount of turpentine available, and with any kind of for-

estry regulation by the United States government or, better, the State governments of Georgia, Florida, South and North Carolina, this can be practically made greater rather than less.

The next paper called for was one on "Kefir," by I. V. S. Stanislaus, and the author presented his subject as follows :

KEFIR AND ITS PREPARATION.

BY I. V. S. STANISLAUS, B. SC., PHAR. D.

The name of Kefir is applied to a beverage prepared from cow's milk with the aid of appropriate ferment called "kefir grains."

This beverage has been used from time immemorial by the inhabitants of the nothern part of Caucasian mountains under various names, as kefir, kapir, kifir, kepu and the like.

Kefir is not an imitation of koumys which the Tartars prepare from mare's milk, but differs from the latter as much as cow's milk differs in composition from mare's milk.

The ferment employed for the preparation has the appearance of crumbs or grains of various sizes cauliflower-like in form. When in dry condition these possess a yellow to brick-red color, while in the moist condition they appear whitish in color.

The kefir grains examined under the microscope appear to be composed of two morphologic forms ; yeast cells (*saccharomyces cerevisiae*, Meyen) and bacteria proper, having the form of cylindrical threads or rods and of their spores which Kery and Krannhals called *Dispora Caucasica*.

H. Struve considers the above bacteria as animal fibers, originating from bags made of hide, and the so-called "burdiuk" in which kefir is prepared on the Caucasus.

Doctors L. Nencki and A. Fabian in their work on Kefir discredit the above assertions of Struve as unfounded, claiming in turn that besides the fibers described by him they found the kefir grains to contain the Hay bacteria (*bacillus subtilis*) the so-called mildew grains of the oidium variety and the bacteria of butter (*bacillus butyricus*).

The ferment described above is variously styled by the Tartars thus : "kefir mildew," "kefir grains," or the "millet-seeds of the prophet," in continental Europe it is known as "kefir champignons" or "kefir mushrooms."

The origin of kefir grains is not definitely known ; the mountain tribes of the Caucasus consider it as of sacred origin and hence the name "millet-seeds of the phrophet." This is based on the oriental legend purporting that the first Mohamed conferred this blessing upon his chosen people.

At the present time the purchase of the grains is possible everywhere ; not so twenty years ago.

No one of the Caucasian tribesmen dared to offer it for sale or even as a gift and this not only to the "infidels" but not even to their own kin, because there existed a strong belief that by parting with some of the grains, the remaining grains would lose the fetishic power to cause fermentation.

The legendary customs of parting from the grains according to a Russian authority were closely adhered to, thus: The daughters upon being betrothed did not receive her dowry of the grains outright, but upon the first return visit, the mother would leave her alone in the room where the grains were stored, this as a sign that in her absence the daughter can follow the American custom, "help yourself."

The probability of the origin of the kefir grains Prof. Podwysocki of Riga explains as follows: The koumys ferment was known in times immemorial, as history shows; when however the tribes occupied as horse-raisers and traders of the plains were compelled to migrate into the mountains, and there owing to the different condition of the soil and geographical distribution were obliged to raise more bovine cattle than horses, this fact caused a shortage of mares' milk. The next step was to add the koumys ferment to cows-milk as the outgrowth of this, in time, the koumys ferment acquired a different form and composition and such we now call new "kefir grains."

This theory Prof. Podwysocki further augments by the statement that outside of the Caucasus neither in Switzerland nor any other mountainous localities were the cattle-raisers fortunate in arriving at the kefir ferment. Also by the fact that the most select koumys can only be prepared from mares' milk when kefir grains are employed, and not with yeast as ordinarily practiced.

When kefir-grains are added to cow's milk two kinds of fermentation occur: alcoholic and lactic. Besides this they peptonize albuminous substances giving rise to physiologically, highly beneficial compounds.

The main components of kefir may be classed as: Fat, lactose, alcohol, carbon dioxide, lactic acid; which should not exceed 0.7 to 1 per cent., inorganic salts and albuminous bodies, which exist here as casein, albumin, acid albumin, hemalbumose and peptone.

The comparative analyses of cow's milk and 24-hour kefir prepared therefrom are highly interesting and instructive:

	Kefir.	Cow's Milk.
	In parts per hundred.	
Specific gravity at 15.40° C.....	1.032	1.039
Total albuminous bodies.....	4.150	4.080
Casein.....	2.760	
Acidalbumin.....	0.300	
Albumin.....	0.680	
Alcohol.....	0.490	
Acid lactate.....	0.520	
Carbon dioxide.....	0.045	traces
Lactose.....	2.050	4.923
Fat.....	traces	3.701
Ash.....	0.630	0.622
Reaction.....	Slightly acid.	Slightly alkaline.

The prepared kefir is of a whitish color, pleasant, and slightly cooling taste.

The quantity of the compounds formed through the so-called "starter" is closely dependent upon the quantity of lactose present in the milk employed and on the quantity of the "starter" added.

It should here be stated that after the kefir is complete and ready for use further changes still occur; thus in the preparation 24 hours old hemalbumoses are absent, but develop only on the third day, and the same may be said of peptone, which can be detected only after the third day.

There are several methods known for preparing the beverage; some of these, however, give unsatisfactory results, and are unduly tedious, and these I have omitted in this outline.

Before we proceed to the preparation of kefir the "grains" should carefully be examined as to their condition, whether healthy or otherwise, and for the freedom from adulterants, which is not an uncommon occurrence of late.

Good healthy "grains" are recognized by their irregular form and size, hardness and yellow to brick-red color, swell up considerably, and becoming rubbery masses, branched on one side and almost smooth on the reverse concave side.

Nefarious varieties of the "grains," which are prepared from bread crumbs, with the addition of brewers' yeast, and thus falsified added to the genuine variety can readily be differentiated from the latter on maceration with water. When so treated they are devoid of the rubber-like springiness and rolled between the fingers become doughlike. When treated with a solution of iodine, they acquire the characteristic blue color.

Having assured ourselves of the quality of the grains we begin with the preparation of the "starter." This is done by macerating them in warm water for twenty-four hours, changing the latter at least four times.

The well-soaked "grains" are next separated from the water by straining, and in the proportion of two tablespoonfuls for every $1\frac{1}{2}$ glasses of milk (350 Cc.) are added to the latter.

The vessel containing the mixture of the grains and milk is covered with muslin and set in a warm place at 15° to 18° C. until the grains begin to float upon the surface. It should be remembered that the mixture requires occasional stirring during the first few hours.

The "grains" can be separated and used in the preparation of several lots.

When used for the first time the grains begin to float but very slowly, sometimes requiring from 3 to 8 hours, and occasionally even more. But when they are used repeatedly for preparing kefir without intermediate drying they float to the surface after 3 to 4 hours.

After a quantity of the "grains" rise to the surface the mixture is strained, and we obtain the liquid called the "starter."

The grains can now be covered with milk and set aside in a cool place until the next day.

The "starter," prepared as above, is mixed with three quarters of a glass (180 Cc.) of previously boiled milk, agitated thoroughly, and poured into a clean bottle, which, however, should not be filled completely, corked immediately and securely, and set aside at a temperature of 20° to 22.2° C. until it begins to thicken, which process requires from 18 to 24 hours in the winter; in summer time from 14 to 20 hours. The mixture acquires the consistency of cream, which can readily be seen through the walls of the bottle.

The thickened mixture is now agitated vigorously, laid upon the side in a cool place, preferably the cellar, where the temperature should not exceed 8.7° to 11.2° C., and agitated every two hours.

Kefir prepared as above is called "day old," and is the weakest. It contains a slight quantity of CO_2 , is viscous, possessing a very pleasant, refreshing and slightly acid taste. It should not contain "cheesy" masses.

If allowed to rest in the cellar for a longer period the "two-day old" and "three-day old" is respectively obtained. But it should always be remembered that the contents be thoroughly shaken at least once every three hours.

We have stated above that "grains" after being used are covered with milk and set aside until the next day. These now carefully washed with water can be used further to obtain new quantities of kefir by covering them with one and a half glasses of milk and repeating the operation as above.

The first lots of kefir are usually of inferior quality; the longer the grains are used, the better the product. It should be remembered that the grains must be thoroughly and carefully washed in cold, distilled water from the deposit of curd which accumulates upon their surface, causing subsequent acid fermentations, which is highly detrimental to their quality and fermentative power.

Second method: Kefir may be prepared by taking a tablespoonful of the dry "grains," covering them with warm water and changing the latter several times during twenty-four hours. Next the grains are daily covered with fresh milk until they become "springy." The so-prepared grains are placed in a decanter covered with three glasses (750 Cc) of milk and agitated frequently during six to eight hours. The "grains" are now strained off, the colate placed in bottles which should not be filled too full, and these latter are proceeded with as described in the first method.

Third method: This method depends upon the employment of "three day old" kefir. The contents of a bottle of the latter is divided equally into three bottles, these are filled within an inch of the top with cold previously boiled milk, corked securely, agitated occasionally at the room

temperature during three days or until the mixture thickens. Then one of the bottles is again divided into three fresh bottles and proceeded with as above.

This method has the one disadvantage that the third and the fourth attenuations spoil quickly.

The following points should be observed in the preparation of kefir: The milk should be fresh, previously skimmed and boiled; the latter condition is imperative to prevent butyric fermentation.

It is also advantageous to sometimes add a teaspoonful of lactose to the milk, as in this wise more alcohol, and CO_2 is formed and the albuminous bodies undergo peptonization much more readily. Good kefir should be a homogeneous, viscous fluid not readily separating into two layers. Fermented kefir for anaemics is prepared by adding to each bottle 0.1 Gm of ferric lactate. Pepsinated kefir is made by adding 0.75 Gm. of powdered pepsin to each bottle.

The paper was received and referred for publication.

A paper on "Hexamethylene-Tetramine" was abstracted by Mr. Daniel Base, the author, the text of the paper being as below.

EXAMINATION OF SOME SAMPLES OF HEXAMETHYLENE-TETRAMINE.

BY DANIEL BASE.

The object of this inquiry was to learn whether the claim that a certain brand of hexamethylene-tetramine is purer than all others has any justification in fact, in other words, to see whether they are not all on a par and therefore equally suited for purposes of medication. If the product sold under the official title, hexamethylenamine, is pure, as found in the market, there is no reason why physicians should order any of the products with trade-names, especially if these are higher-priced than the articles sold under the official title. Perhaps the shorter trade-names might be considered a justification for ordering these in preference to the one with the long official name. This would be simply a question of convenience and not one involving the merits of one article as compared with another.

The following samples, in loose granular form, were examined: one sample each of aminoform, formin, cystogen, urotropin, and two samples of hexamethylenamine of different manufacturers.

The color of the samples was pure white, except that of aminoform which was a light yellowish-pink. All were odorless, and when dissolved in water, they had at first scarcely any action on litmus paper, but after a while an alkaline reaction developed.

When shaken with water, the samples were seen to consist of small, clear, lustrous crystals. When heated moderately in a platinum crucible, they all volatilized with scarcely any charring, and when the crucible was

raised to low red-heat no weighable residue was left. The quantity volatilized was about a gram.

Alfred Wöhlk,* in an article on urotropin, states that when pure urotropin is heated with Nessler's Solution, no reduction or coloration takes place. This test was tried on all the samples. About 0.5 Gm. of the substance, dissolved in 5 Cc. of water, was mixed with 5 Cc. of Nessler's Solution. After shaking awhile, a pale, lemon-yellow precipitate formed, which according to Romijn † is a double salt of hexamethylene-tetramine and potassium mercuric iodide. This precipitate dissolved upon heating, the clear solution then having a pale-yellow tint, somewhat like that produced in a good drinking water by Nessler's Solution. Addition of a trace of ammonia (0.04 Cc. of $\frac{N}{100}$ solution = 0.0067 Mgm. NH_3) to the hot mixture, or to the solution of the specimen before adding the Nessler's Solution, gave a decided brown color. Likewise a trace of formaldehyde or of paraform caused precipitation and reduction to gray metallic mercury. These are sensitive reactions, and the objection might be offered that they are too sensitive to be applied to commercial hexamethylene-tetramine, but the fact remains that the specimens so tested with Nessler's Solution gave negative results, thus showing the absence of paraform or of ammonium salts or any such ammonia derivatives as give colors or precipitates with Nessler's Solution.

It seemed desirable to apply some quantitative method to test the purity of the samples. For this purpose the following method was pursued, which seems to give accurate results. It depends upon the fact that when hexamethylene-tetramine is heated with an excess of sulphuric acid, formaldehyde is given off and the nitrogen is liberated as ammonia, which unites with the acid. In each case one gram of the sample was evaporated with an excess (40 Cc.) of normal sulphuric acid on a boiling water-bath to dryness. The residue was repeatedly moistened with water, stirred, and again evaporated to dryness, until the odor of formaldehyde was only faint. It was then dissolved in about 100 Cc. of water and titrated in the dish with normal alkali, using good litmus as indicator. The difference between the amounts of alkali and acid gave the number of cubic centimeters of acid that united with the nitrogen as ammonia in one gram of the specimen. Theoretically, one gram of pure hexamethylene-tetramine, $(CH_2)_6N_4$, is equivalent to 28.74 Cc. of normal acid, as may be deduced from the equation $(CH_2)_6N_4 + 6H_2O + 2H_2SO_4 = 6CH_2O + 2(NH_4)_2SO_4$.

* Zeitschr. für analyt. Chemie, 40, p. 765 (1895).

† Ned. Tijdschr. Pharm., 7, 169.

Results.

Name.	Quantity.	$\frac{N}{1}$ H ₂ SO ₄ Required.		Per cent. of N.		Per cent. of Hexamethylene-tetramine Found.
		Theoret.	Found.	Theoret.	Found.	
Formin	1 Gm.	28.74 Cc.	28.67 Cc.	40.03	39.94	99.75
"	1 "	.....	28.84 "	.....	40.17	100.34
"	1 "	.....	28.67 "	.....	39.94	99.75
"	1 "	.....	28.81 "	.....	40.13	100.24
"	1 "	.....	28.81 "	.....	40.13	100.24
Urotropin.	1 "	.....	28.83 "	.....	40.16	100.34
Hexamethylenamine, <i>a</i>	1 "	.....	28.77 "	.....	40.07	100.10
Hexamethylenamine, <i>b</i>	1 "	.....	28.72 "	.....	40.00	99.93
Cystogen.	1 "	.....	28.71 "	.....	39.99	99.89
Aminoform	1 "	.....	28.77 "	.....	40.07	100.10

These results agree tolerably well, and show that the method gives not only fairly constant results, but also that the various specimens are practically pure. The method is simple and easily carried out, even by a pharmacist, who, as a rule, is not equipped for carrying out methods that require involved manipulations and apparatus.

Inasmuch as a difference of 0.1 Cc. of normal acid used in the titration of one gram makes a difference of 0.14 per cent. in the nitrogen and 0.34 per cent. in the hexamethylene-tetramine found, it would be better to back-titrate the excess of acid first with normal alkali to near the neutral point, and finish with tenth-normal alkali.

From the foregoing examination the conclusion seems justified that with one exception the samples in question were pure and equally suited for medicinal purposes, and that there is no more reason for a physician to order the substance under trade names than under the official title.

In the case of the sample of aminoform, exception could be taken on account of its not being pure white, although in other respects it was not different from the other samples.

Slight fault might be found with one of the two samples of hexamethylenamine, because it gave a slightly cloudy solution. This was due probably to some carelessness in purifying the substance. In other respects it seemed as good as the other samples.

Unless manufacturers make wilful additions to their products, or are grossly careless in the preparation of them, there is no reason why one firm's hexamethylenamine should not be as pure and as good as that of any other firm, since the manufacture of the substance is simple and there is little likelihood of impurities entering into the substance from the materials used, as is the case with such chemicals as sodium carbonate or potassium iodide.

Three samples of tablets were also examined, namely, urotropin, cystogen and formin. These all gave clear solutions, having weak alkaline reaction to litmus, and behaved towards Nessler's Solution just like the previously discussed granular forms of the same substance.

All the tablets volatilized without visible residue when heated in a crucible, and appeared to be of the same degree of purity as the corresponding granular forms; hence no titration as above was made.

An item of interest that might be mentioned is in regard to the weight of the tablets.

Urotropin tablets, labeled $7\frac{1}{2}$ grains.

Weight of 4 tablets = 30.6 grains (1.983 grams).

Weight of 1 tablet = 7.65 grains (0.4957 grams).

The average weight of one tablet is 0.15 grain more than claimed.

Cystogen tablets, labeled 5 grains.

Weight of 5 tablets = 22.839 grains (1.48 grams).

Weight of 1 tablet = 4.568 grains (0.296 grams).

The average weight of one tablet is 0.43 grain less than claimed.

Formin tablets, labeled 5 grains.

Weight of 5 tablets = 24.15 grains (1.565 grams).

Weight of 1 tablet = 4.83 grains (0.313 grams).

The average weight of one tablet is 0.17 grain less than claimed.

Department of Pharmacy, University of Maryland.

Mr. Schlotterbeck said that he hoped everybody would read Mr. Base's paper on this work, as it was a very important one. He hoped other chemists and pharmacists would do work along this line. This was not the only preparation exploited over the country under a fanciful name to hoodwink the physicians. The physicians would prescribe some of these preparations at a dollar an ounce, when they could be as well supplied under their proper pharmacopœial name at ten cents an ounce. The Chair said he thought this was especially true in regard to such things that varied so in price, and so slightly, if at all, in composition. Mr. Kebler said he had come across a sample of ordinary fusel-oil for rheumatism—and he did not know what else—a few ounces of which sold for \$2.50.

The Chair called on Mr. Seidell to read a paper on the physical constants of chemical compounds, and Mr. Seidell gave an abstract of his paper, its text being as below:

THE PHYSICAL CONSTANTS OF THE CHEMICAL COMPOUNDS
OF THE U. S. P.

BY ATHERTON SEIDELL, WASHINGTON, D. C.

Among the first things taught students of chemistry is that all elements and chemical compounds of them are characterized by definite properties such as crystalline form, melting and boiling points, solubility, etc. These properties are usually termed the physical and chemical constants of the substance, and, as is generally recognized, are as unchangeable as the composition of the compound itself. It is upon these very constants that the surest tests for the identity of many substances are founded, and in addition many of the most important qualitative and quantitative methods of analysis depend upon them for their applicability.

In the July number of the Bulletin of the American Pharmaceutical Association, page 197, the statement occurs that "a complete digest was made (of the physical constants) from about a dozen of the most important pharmacopœias of the world, and the differences which appeared were striking indeed, and demonstrated how practically impossible it is to get anything like absolute uniformity in these standards. Absolute uniformity is a myth and exists only in the minds of the uninformed." According to this statement it might be thought that the physical constants of chemical compounds are subject to change, but a moment's consideration is enough to show that the differences referred to are only those of the quoted constants, and arise through inaccurate or careless determinations upon which are based many of the statements found in the various important pharmacopœias.

It is very evident that any definite chemical compound of absolute purity can have only one set of physical constants and therefore when these have once been accurately determined, there is no further need for differences in the statements of the various Pharmacopœias. The difficulty of course lies in the accurate determinations of these constants, but there is no reason to doubt that as time goes on, the principal physical constants of all the generally used chemical compounds will have been established with exactitude. This work however is of such a character that much time, patience and care are required in its execution; it does not command the recognition or emoluments usually bestowed upon meritorious work in other fields of the science, and therefore commends itself to comparatively few investigators. On this account the available amount of such data of satisfactory reliability is limited, and it is therefore necessary to bring to light all of it that can be found, and at the same time weed out from our standard reference books all that is of uncertain reliability. With this idea in mind, an especial effort has been made to bring together in the compilation described in the present paper such data as could be found in places

not usually sought by the authorities who have heretofore been charged with the compilation of our own and other Pharmacopœias.

The question whether solubility should be treated as a physical constant upon the same basis adopted for the other physical constants of the U. S. P. is open to some discussion. It is well known that the solubility data of the Pharmacopœia find their principal use as a guide to pharmacists in compounding mixtures, and for this purpose approximate figures only are essential. On the other hand it is to be mentioned that for the purpose of the pharmacist, the more accurate data introduced as constants of solubility would be as useful, if not more so, than approximate figures, and in addition would add much to the value of the book from the point of view of specialists and investigators dealing with pharmaceutical problems.

There are of course other reasons why the interests of pharmaceutical chemistry will be best served by including solubilities with the other physical constants, and attempting to raise the standard of the data of this character, but a discussion of them is unnecessary at this time.

The necessity for the large number of revisions of the constants of the U. S. P. is due principally to two causes: First, the majority of the substances included are allowed to be of a lower degree of purity than absolutely chemically pure, and, therefore the constants given for them are of necessity influenced by the admixture allowed, and must be revised for every change of purity authorized for the substance. Secondly, many of the constants, not determined specifically for the U. S. P., are apparently taken from other pharmacopœias and reference books rather than from the original source of the information. In this way, especially in the case of solubility, much uncertainty has arisen, since the basis upon which the results are reported by various pharmacopœias and reference books is either not stated at all, or is a different one from that adopted for the U. S. P. The universal custom for stating solubility results is apparently in terms of parts of solvent required to dissolve one part of the substance. The indefiniteness of such a statement coupled with the frequent lack of information in regard to the temperature of the determination, can only be appreciated by one who has attempted to ascertain the comparative value of a number of solubility determinations gathered from several pharmacopœias.

In regard to other constants such as melting-points, boiling-point, crystalline form, etc., there is greater uniformity in the recorded statements. This may no doubt be due to the similar details of the determination of these constants, and also to the possibility of obtaining the smaller requisite amount of material for a determination in a purer condition than the larger amount frequently required for a solubility experiment.

In regard to the manner of stating solubility results, it appears particularly unfortunate that the term "part" should have been retained so long without the introduction of some modification which would show

when it designates weight and when volume. The compilers of the U. S. P. are at fault in this respect in common not only with those of practically all other pharmacopœias but with the authors of most of the present day pharmaceutical reference books. There is no statement in the U. S. P. to show that "parts" of solvent or of solute means weight parts in all cases, and likewise there is no intimation in the British Pharmacopœia that "parts" when referring to liquids indicates volumes, although such appears to be the case. A statement in the U. S. P. that the word part means part by weight in all cases not specifically stated to be otherwise, would be one step towards a better condition of affairs in regard to uniformity in the physical constants quoted. The meaning of the term "parts" varies with different authors and in fact it is at present used so loosely that results expressed in terms of "parts" may almost be considered as rough approximations, which are in many cases numbers rounded with a large enough margin, to insure the obtaining of a clear solution after a brief space of time. It is needless to say that the only satisfactory way to express solubility results is in terms of weight of solvent and of solute, giving the specific gravity of the saturated solution to permit the conversion of figures from the basis of weight to that of volume if desired.

As is well known, the term physical constant as generally accepted refers to data determined upon chemical substances of absolute or as near absolute purity as can be obtained. Therefore if physical constants are to be given for the substances of the U. S. P. at all, there appear many reasons why the data for absolutely pure material should be given in preference to data for material of the degree of impurity allowed. In this way the necessity for revising the published constants would be very greatly diminished, and the only changes which succeeding revisions of the book would require would be of the allowable deviations from these fixed constants. An additional reason in support of this plan is that the introduction of data for substances not of the highest purity promotes careless determinations, since it can hardly be expected that an investigator would devote the time and care to a determination intended for one edition of the Pharmacopœia that he would give to a determination which he hoped to withstand the criticism of succeeding years.

Another point to which attention should be directed is that of the purity of the solvents which are employed. In this connection is to be mentioned the question of determinations of solubility in alcohol. The standard strength of alcohol prescribed by different pharmacopœias varies, and consequently if we compare the statement of the solubility of a given substance in alcohol as found in one pharmacopœia with the figures quoted for the same substance in another pharmacopœia, differences may or may not be encountered depending upon whether the two statements are based upon individual determinations, or whether one figure (as is frequently the case) has been copied from the other without making allowance for the different concentrations of the alcohol employed.

Such uncertainties would be largely obviated if care were taken in all cases to report determinations of the solubility in absolute alcohol, and if it appeared necessary to give results for official alcohol also. It may be argued that the pharmacist wishes to know the figure for official alcohol, but in reply to this it is to be mentioned that for the purpose of the pharmacist, who admittedly is concerned only with approximate figures, the one would be as useful as the other, but as a physical constant of the substance in question the solubility in absolute alcohol is very much to be preferred.

It seems probable that for some time to come the use of certain qualitative expressions for degree of solubility, such as very soluble, slightly soluble, insoluble, etc., will be required, and since at present the meanings attached to these various expressions have become so diversified, it appears that some attempt should be made to prescribe rough limits for these descriptive phrases as used in the U. S. P. Such a plan would tend to a better interpretation of the descriptions of the properties of pharmacopœial substances.

The previous points which have been brought out in connection with the physical constants in general, but of solubilities in particular, show how many things there are to be considered in the matter of constants of chemical compounds. It is believed that uniformity and unchangeability of recorded data of this character can be most quickly effected by taking into consideration the points emphasized in the preceding pages. The existing data are for the most part very fragmentary. For very few of the substances of the Pharmacopœia can a complete set of reliable constants be found. The material is very widely scattered, and has been copied and rearranged so often that most of it cannot be traced to its source. It is exceedingly difficult, and in many cases practically impossible, to decide which of the statements quoted by different authorities are to be accepted as correct. In view of these and other considerations the present compilation was undertaken. The object has been to present the existing data in such a manner that the value of the various determinations can be judged with some accuracy, and possibly in some case a selection of the most reliable be made.

It was also anticipated that such a collection would point out to prospective investigators the particular substances upon which study could be bestowed at present to best advantage, and in this way permit more rapid progress in the establishment of the data, by eliminating the unnecessary work involved in repeating determinations of assured reliability.

Although it appears from the statement already quoted from the July number of the "Bulletin" of the American Pharmaceutical Association that a compilation of the physical constants of the principal pharmacopœias was made for use in preparing the eighth revision of the U. S. P., this digest has apparently never been published, and in fact the present

writer only became aware of its existence after beginning the compilation described in this paper. It also appears that the digest was made particularly of the constants contained in the principal pharmacopœias of the world, and apparently without reference to many of the original sources of the data. An endeavor has been made in the present case to improve upon this plan by not only collecting the data from the pharmacopœias, but also from a number of the important chemical reference books, and in all cases where possible from the original articles in the important chemical and pharmaceutical journals. A very large amount of the solubility data upon chemical substances having recently been consulted by the author and brought together in a volume entitled "Solubilities of Inorganic and Organic Substances," it appeared that the circumstances were particularly favorable for making a comparative study of the chemical substances of the U. S. P. as above outlined.

In the present compilation therefore, the attempt has been made to bring together the various figures contained in the German, English and United States Pharmacopœias and also such reference books as Hager, Squires, Schneider and Suss, Schmidt, Beilstein, etc., and compare these with the data taken from the original sources as referred to in "Solubilities of Inorganic and Organic Substances." In the case of the solubility data references are given to the sources of the information, but with the other constants, which for the most part are reported with only slight variations by the different authorities, no especial attempt is made to indicate the source of the data.

The scope of the compilation includes all substances of the U. S. P. which have a definite composition and of these there are about 220. The data have been arranged as follows for each substance—name, formula, physical state, and if a solid, the crystalline system, the specific gravity, melting-point, boiling-point, and solubility. Under the latter heading is given the solubility in water, in alcohol, ether, chloroform, benzene, etc. The compilation which has been prepared is of course unsuited for presentation to this Association for publication, and this is even less to be considered since arrangements are in progress for its publication in the form of a Bulletin from the Hygienic Laboratory of the P. H. and M. H. S. Nevertheless it was thought that the information which has been gained in the course of the work upon this material would be of interest at this time. Many of the points which were brought out have already been dwelt upon, but among those, which an examination of these compiled physical constants themselves, has revealed may be mentioned the following :

The constants other than of solubility are, for the most part, reported with fair uniformity by the various pharmacopœias and reference books. In fact it has been the exception to find results which unaccountably differed sufficiently to require that two or more figures be quoted for the same constant of a given substance.

The solubilities reported by the various pharmacopœias and pharmaceutical reference books vary in most cases over quite a wide range. It seems probable that the wide differences may be due largely to the standards of the determinations adopted by the individual workers rather than to experimental inaccuracies. On this account it is often impossible to harmonize the various results quoted from these sources, and derive from them any figures which can be looked upon as reliable.

Of the solubility results gathered from the original sources and classed as data of unquestioned accuracy, those for the inorganic compounds predominate, and therefore, at present, there is greater demand for the investigation of the solubilities of the organic compounds, than of the inorganic substances of the Pharmacopœia.

Of the pharmacopœial substances, however, which are at present in an unsatisfactory state so far as their solubility data are concerned, there are none to compare with the alkaloids and their salts. Of these compounds the greatest discrepancies in their quoted solubilities are to be found, and among them, some of the most common, are the ones for which satisfactory data are in most pressing demand. A striking example is that of morphine and quinine, but it may be said that of none of the alkaloids are the solubility results in a satisfactory state. In fact it almost seems that the complexity or some other characteristic of these compounds affects their action towards solvents in a manner not yet understood, and on this account it is rare that two investigators are able to obtain concordant results upon the same alkaloid.

The subject of the physical constants of alkaloids is therefore one which is at present especially deserving of the attention of investigators. It has been suggested that the variation in the reported determinations of the solubilities of alkaloids is due to the variation in the physical condition of the samples. The fact that alkaloids are more soluble when in the amorphous state is offered in support of this view. It is hoped that opportunities will arise in this laboratory for investigating this and other unsettled questions in the field of the physical constants of the U. S. P.

The determination of the solubility of the various substances of the Pharmacopœia is a matter which should appeal to instructors and professors in charge of the work of advanced students in pharmaceutical chemistry. The work is of a character well fitted to teach the student care and accuracy, and in addition the reliability of the results can be established, either by several students making the same determination, or a single student repeating his work under various conditions. It is hoped that the present compilation will be the means of stimulating much work of this character.

Mr. Coblentz said that many criticisms, with quite a variety of results, had been offered on this subject of solubility of inorganic chemicals.

Variations were due to the method employed and quality of the salt. The method used for the determination of the U. S. P. solubility was that of digesting the finely powdered substance with the solvent at or as near the desired temperature as possible, and during the last hour of digestion the temperature was rigidly observed. Again, the quality of the substance examined must be in accordance with the U. S. P. requirements, for it is quite evident that if we compare the solubility of a 92 and 98 per cent. salt, there will be variations, particularly so if the 8 or 2 per cent. impurities are more or less soluble than the pure substance.

Mr. Seidell said he recognized the point made, but had not gone into a discussion of it because the time was so limited.

The paper was referred to take the usual course.

The Chair called for a paper on the Identification of Tinctures by Chemical Means by Frederick E. Niece, and Mr. Niece presented his subject in abstract, the following being the text of his paper :

THE IDENTIFICATION OF TINCTURES BY CHEMICAL MEANS.

BY FREDERIC E. NIECE, PHAR. D., NEW YORK CITY, N. Y.

Aside from the physical tests which comprise the color, odor, taste and appearance, there remain very few data at the pharmacist's disposal for the ready identification of the purely tinctorial preparations.

The above simple tests, while of value to a limited degree, are at their best extremely uncertain in view of the fact that no two individuals will always agree as to odor, color and taste, consequently something more conclusive is very much a desideratum.

It therefore necessarily follows that recourse must be made along other lines than the above, and to be of any value must not only be a physical but a chemical one as well.

As a rule chemical methods and chemical reactions are so well founded that they are productive of results less doubtful, and are for that one reason alone more satisfactory than physical ones. Physical tests, however, in conjunction with chemical ones are essentially in order, and so much so as to be decidedly useful in the determination of more accurate results.

It appears that some work was done on tinctures by a chemist by the name of Von Halle (Apotheke Zeitung, 1890). His original paper, which appeared in the above, was never consulted, the same being reviewed only in abstract form. This, of course, was so well abstracted as to have left out valuable data, therefore a great deal of detail had to be derived by experiments. The work done by Von Halle was on tinctures of foreign make, therefore the tests in most cases were not applicable to those of domestic production. This accordingly necessitated an entire new series of experiments with considerable modification in the methods so as to adapt them to tinctures of the U. S. P. Several tests were outlined and tried primarily with the idea of obtaining as reliable methods as possible

by which chemical tests could be readily applied to tinctures, and conclusions quickly reached.

In following out the tests as instituted it was clearly noticeable in almost every instance that characteristic reactions were readily obtained—quite distinctive of the tincture under examination—and so much so that this alone was deemed sufficient reason for mentioning the results at this time.

While the work thus far accomplished is somewhat meagre, it fully demonstrates the fact, however, that valuable information is at our disposal in this particular direction if we would but seek it.

This information is of such a nature, however, that it may be depended upon with just as much reliance as the color and temperature tests in the case with fixed oils and fats.

The commercial value alone of this matter will become more apparent when it is observed that thousands of dollars are annually wasted through the source of labels becoming detached from their containers or otherwise being obliterated beyond recognition. This is strongly manifested in the case of fluid extracts which in reality are only tinctures in a more or less concentrated form.

On the face of the results thus far obtained there is every reason to believe that experiments will no doubt result in producing a large number of characteristic reactions that may be relied upon under the most adverse circumstances. This, of course, to be of the greatest value, should imply simplicity of procedure in every case where practical—for readily-applied tests are principally the object in view.

On the point of the identification of tinctures other than by physical means the U. S. P. is non-committal, while in some of our foreign authorities there are to be found chemical methods by which certain tinctures may be easily identified.

Perhaps there are strong reasons for not even mentioning the same. No doubt the lack of space is one; another strong reason may be the limited data at hand; or the unreliability of the tests known or proposed; or the uncertainty of the same in the case of mixtures or compound-tinctures; or the utter impossibility to recognize the value or even the need of such methods. All of these features are more or less drawbacks, especially the latter ones, but then there should be some means of overcoming arising difficulties, just the same as in other matters of a like nature, experiments, alone deciding.

Then again, the assaying of drugs of virtue that enter into the tinctures or the finished products themselves is, perhaps, all that is really desired. This may be the strongest reason for not adopting identity tests, and for its purpose serves very well. This naturally suffices to a great extent, but not so with those tinctures that are beyond or totally indifferent to the process or have no values to assay.

Then the process of assaying is long and tedious, requires extraordinary

skill and training for success, and very often leaves much to be desired with little information gained as to the actual identification of the preparation under examination unless extended methods of alkaloidal or glucosidal testing are resorted to. This, of course, is extremely confusing and oft-times doubtful, especially in the hands of the inexperienced.

But after all is said and done it is quite clearly understood that, in all chemical manipulations it is more the rule than the fashion to first identify specimens under examination by some qualitative means and then determine their values afterwards. This is speaking broadly for example, of a specimen of which all information as to its identity has been lost. Consequently, this again is considered a most excellent reason for the suggesting of tests for the identification of tinctures by chemical means.

Taking the facts thus far more seriously in mind it might be well to first state that a number of tests were tried on important tinctures with a view of ascertaining to what extent they could be used as a ready means of identifying tinctures *per se*.

The results obtained were so pleasing and pronounced that it was thought well to mention at this writing a few of the more important ones in support of the argument, a greater number being reserved for a more extended treatise. The few examples herewith submitted for consideration which I trust have just reasons for existence, are of U. S. P. origin. In fact all of the tests were applied to tinctures made according to U. S. P. methods and have therefore been so constructed in detail as to offer a test for the best results possible.

While the work thus far is light and still in its infancy, and as it is realized that conclusions should not be jumped at immediately, it thereby follows that, more extended experiments must be made in order to more fully complete the work with any degree of accuracy. Therefore, it is intended to continue the work in the future when an attempt will be made at a systematic grouping of the tinctures, making use of group reagents where possible, and thus lessen the number of reagents for use.

A few identity tests and their results follows :

Tincture of Aloes. Take of the tincture 4 Cc. add 4 Cc. of ether, shake, let stand awhile, and syphon off the upper ethereal layer, add to this in a test-tube 2 Cc. of stronger ammonia water. At the zone of contact of the two solutions a distinct scarlet-colored ring will be observed, which becomes darker first on agitation, and then allowing the solution to remain at rest.

Tincture of Calumba. Evaporate 4 Cc. of the above to dryness in a watch glass on a water bath. Treat the residue with 4 Cc. of concentrated HCl. To this add a good-sized crystal of potassium chlorate. Agitate gently, when a beautiful deep reddish-pink color will be produced.

Tincture of Cinchona (plain or compound). Take 4 Cc. of the tincture, add a mixture composed of chloroform, 4 Cc.; ether, 2 Cc.; and stronger ammonia water, 2 Cc. Shake the solution vigorously for a few seconds,

allow the same to stand for awhile, and then syphon off the lower light-colored stratum. Place this in a clean test-tube, add an equal volume of sulphuric acid, dilute, shake well, let stand and discard the lower colorless stratum by syphoning. Treat the remaining upper stratum by adding three times the bulk of water, and then carefully add sufficient Javelle water to just discharge the bluish fluorescence. Next cautiously add an excess of stronger ammonia water without mixing. On standing, a green color develops at the line of contact, gradually diffusing throughout the solution.

Tincture of Colchicum (seed). Four Cc. of the tincture are taken and evaporated to dryness over a water bath in a watch glass. The residue is taken up with 10 Cc. of warm water, then filtered, and the filtrate treated in a test-tube with 2 Cc. of ether and 6 Cc. of chloroform added successively. The upper stratum is syphoned off and discarded. The chloroformic solution is then evaporated to dryness over a water bath when a lemon-yellow residue results. To this is added two drops of nitric acid, when a reddish color is imparted to the residue while in direct contact with the unaltered acid. The vapors evolved during the reaction color the surrounding residue a nice violet. The addition to the violet-colored residue of a few drops of a 10 per cent. watery solution of stannous chloride produces a deep pink, while ammonia produces under like conditions an orange to a brown color.

Tincture of Cubeb. Thirty Cc. of the tincture are evaporated to dryness in a watch glass over hot water. Three drops of sulphuric acid are next added to the above residue when a deep violet to a carmine color results. The reaction is very clear and distinct. The oleoresin goes into solution with the acid.

Tincture of Digitalis. Twelve Cc. of the tincture are placed in an evaporating dish and evaporated to dryness. To the dry residue, add 10 Cc. of water and 5 Cc. of a 10 per cent. solution of lead acetate, warm and filter. To the filtrate in a test tube add 6 Cc. of chloroform, shake, let stand awhile, and then syphon off the chloroformic layer.

Evaporate the chloroform spontaneously in a watch glass. Place the same, when dry, over a sheet of white paper and by the aid of a glass rod apply a drop or two of strong sulphuric acid and then a few drops of bromine water when a nice violet color is produced.

Tincture of Galls. Take 4 Cc. of the tincture and add 4 Cc. of ether, shake—not too vigorously—after standing, syphon off the ethereal layer and divide into two test tubes.

To number one add 2 Cc. of alcohol, 2 Cc. of water and one drop of a 5 per cent. water solution of ferrous sulphate when a blue-black color ensues.

To number two add 2 Cc. of alcohol, 2 Cc. of water and 4 Cc. of stronger ammonia water and 2 Cc. of Javelle water when a deep red color results at once, rapidly vanishing to a pale yellow.

On adding an equal volume of the ammonia water and the solution then vigorously shaken the foam will be seen to have acquired a pink tinge.

Tincture of Guaiac. Place 2 Cc. of the tincture in a test tube, add 2 Cc. of dilute alcohol and three drops of a 2 per cent. solution of hemoglobin (Merck's product dissolved in water containing 20 per cent. alcohol and acidified with acetic acid); then finally add three drops of hydrogen peroxide, when a deep blue color is immediately imparted to the solution. The blue coloring substance is soluble in chloroform which on being added dissolves it out of solution and settles to the bottom of the tube.

This solution has a slight fluorescence and a spectroscopic index.

Tincture of Nux Vomica. Evaporate 15 Cc. of the tincture to dryness, add 10 Cc. of water and filter. To the filtrate add 0.5 Cc. of ammonia water, and then add 4 Cc. of chloroform, agitate, let stand, and for use remove the lower chloroformic layer. Evaporate the chloroform. The residue left is divided into three separate watch glasses. Heat all three to dryness over a water-bath. Treat as follows on a sheet of white paper:

To No. 1 add a few drops of nitric acid when a deep red color results.

To No. 2 add a few drops of sulphuric acid, which results in a pinkish color, then add a crystal of potassium dichromate and stir with a glass rod, when a violet color is imparted to the outer edges of the spot.

To No. 3 add a few drops of nitric acid, a deep red color is produced, evaporate this to dryness on a water-bath, a yellowish residue remains.

Divide this residue into two portions and place on watch glasses. To No. 1 add one drop ammonia water, a green color slowly develops on the outer edge of the drop.

To No. 2 add one drop of a 10-per cent. solution of sodium hydroxide in water, a violet color is slowly developed.

If ammonia vapors are passed directly over the spot after being made alkaline with sodium hydroxide, a violet color is quickly produced.

Tincture of Opium. Take 4 Cc. of the tincture, add 8 Cc. of a 10-per cent. solution of calcium chloride in water, warm gently, then filter. Discard the filtrate, but keep the precipitate on the filter. Pass 4 Cc. of dilute hydrochloric acid on and through the precipitate on the filter. Take one cubic centimeter of this acidulated filtrate, add 60 Cc. of water in a porcelain evaporating dish, then 1 Cc. of a 10-per cent. solution of ferrous sulphate in water, when the mixture assumes a blood-red color not discharged by mercuric chloride, but slowly colored brown with Javelle water.

Tincture of Quebracho. Four Cc. of the tincture are first evaporated to dryness (the residue has a tonka- or coumarin-like odor). To the residue add a sufficient amount of water, acidulated with sulphuric acid, to dissolve it, then filter. This dark solution has a deep bluish-green fluorescence by reflected light, and a dark brown color by transmitted light. Dilution with quantities of water does not alter the phenomena.

To this filtrate add solution of sodium hydroxide to alkalinity, then add 4 Cc. of chloroform, shake, let stand, decant the chloroformic solution, evaporate the chloroform, dry the residue, and then add sulphuric acid—a few drops followed with a crystal of potassium dichromate in a watch glass over a white surface produces a color from a red to a dirty brown.

Tincture of Strophanthus. Four Cc. of the tincture are evaporated to dryness at a temperature much below the boiling-point of water. Mix the residue with two drops of dilute sulphuric acid and then add 10 Cc. of water.

The results should be the following: First a greenish-blue color followed by a brown color, and lastly, on exposure, a muddy green.

The Chair suggested that an important thing in carrying out this work would be to apply a method for identifying the particular tincture to all other tinctures in turn in order to see that wrong conclusions were not reached. When it comes to mixtures and tinctures the work is very complicated, indeed.

The Chair stated that this completed the list of papers on the program and called for new business. The Secretary said that no new business had been reported to him. The Chair then asked if anyone else had any new business to bring before the Section, but there was no response.

The installation of officers was called for as the next order of business, and the Chair stated that as it so happened in this case that the installation would consist merely in a change of seats by Mr. Coblenz and himself, he thought it unnecessary to go through the formality of appointing a committee to escort the Chairman and Secretary to the rostrum to be installed, and he would simply say that he welcomed Mr. Coblenz to the Chairmanship of this Section, and hoped he would receive the same support in his work for the next year that had been tendered to himself during the past year.

Mr. Coblenz said he wished first to call attention to the fact that his associate on this committee had performed the work of both Secretary and Chairman during the past year, and deserved a great deal of credit for his good work. He said it would give him a great deal of pleasure to accept the chairmanship of this committee, because it had been just twenty-one years since, at the Providence meeting, he had occupied the same Chair, and when he looked back and compared the number and character of papers presented then with those presented now, it showed the wonderful progress which had been made by the Association in that time. In those days, he said, they had to send out queries, and thereby managed to eke out a few commonplace papers, whereas now a great many papers were offered before the Section on many interesting and instructive subjects. He thought the progress in the last twenty years had been especially along the lines of chemical research. The American Pharmaceutical Association

had developed wonderfully along the line of pure and applied chemistry, and many of its papers were deserving of a place before the American Chemical Society and the Society of Chemical Industry. He said he felt proud that pharmacists were capable of accomplishing things that the chemists themselves would be proud to accomplish.

Mr. Coblentz then introduced the new Secretary, Mr. Vanderkleed, in turn. Mr. Vanderkleed said it would give him pleasure to do all he could during the next year, looking to the furtherance of the work of the committee. Of course, they wanted the loyal support of the members of the Association in the presentation of papers, and he said if they were as loyal next year as they had been this year, two days would be required for the work of this Section, instead of one.

There being no further business to come before the Section, Chairman Coblentz declared the session adjourned.

The following is the text of the papers read by title :

ON MARRUBIIN. *

BY H. M. GORDIN.

PRELIMINARY REPORT.

Of the various methods which have been proposed for the extraction of marrubiin from horehound the one given by Matusow † seemed to be the most promising both in point of yield and simplicity of operations. Matusow's method consists in extracting the horehound with acetone, distilling off the solvent and extracting the residue with hot benzene. On cooling the benzene solution crystals separate out which according to Matusow consist of marrubiin. I have carried out Matusow's directions faithfully and obtained the crystals, but a careful examination of these showed them to be not marrubiin, but potassium nitrate. I have therefore devised another method of isolating marrubiin which I shall describe in a larger paper which I am preparing on the subject and in which all the details and analytical data will be given. At present I wish to report briefly the results so far obtained. Marrubiin has the formula, $C_{21}H_{28}O_4$; it melts at $154.5-155.5^{\circ}C.$; it is very easily soluble in acetone, chloroform, pyridine, warm phenol and hot alcohol; difficultly soluble in ether, benzene and cold alcohol. It requires for solution about 60 parts of cold alcohol and about 20,000 parts of cold water. It is dextrorotatory. It is not affected by cold aqueous or alcoholic potassium hydroxide. When boiled with alcoholic potassium hydroxide for a short time marrubiin is hydrolyzed, taking up a molecule of water and becoming converted into an acid which I have named marrubic acid. Marrubic acid has the formula, $C_{21}H_{30}O_5$; it melts at $173-174^{\circ}C.$, is dextrorotatory and forms easily soluble salts none

* To the Wm. S. Merrell Chem. Co. I wish to express my thanks for liberally supplying the material for this work.

† Am. J. Pharm. 1897, 201.

of which could be obtained in crystalline form. While marrubiin does not reduce Fehling's Solution or ammoniacal silver nitrate, marrubic acid reduces them both very readily. The acid is monobasic and forms esters of which the methyl and ethyl compounds crystallize easily.

Northwestern University School of Pharmacy.

SOME SOURCES OF ERROR IN THE CHEMICAL EXAMINATION OF URINE.

BY JOSEPH L. MAYER.

Notwithstanding the fact that the pharmacist is constantly urged to offer aid to the physician and general public in the form of pathological examinations, particularly urinalysis, very little is written with reference to the possibility of being in error in connection with a finding due to failure to observe necessary precautions.

Some of the more prominent factors associated with the subject of urinalysis are the following :

Where a quantitative determination is sought the entire urine for twenty-four hours should be collected in a bottle containing a small piece of thymol. Chloroform is often recommended and if used information should be supplied to that effect. Neglect to make mention of this may lead one to report sugar where none exists if Fehling's Solution is employed as chloroform has the power to reduce this reagent in a manner similar to glucose.

In connection with the subject of odor and color, sight must not be lost of the fact that innumerable newer remedies now prescribed play a very important role in producing these conditions.

In determining the specific gravity the urine should be as nearly 60 degrees F. (or the temperature for which the instrument is graduated) as possible. If the temperature is considerably above this 1 degree should be added to the urinometer reading for every 6 degrees F. that the sample is above 60 degrees F.

Where a Westphal balance is available, it should be employed, if however an ordinary urinometer is used, it must be standardized by means of the specific gravity bottle employing a solution of sodium chloride and its exact value determined. Very few of the urinometers on the market are sufficiently accurate to depend on without standardization. The reaction of urine is sometimes "amphoteric," a condition in which it effects neither blue nor red litmus paper with the result that it is often necessary to employ a small piece of both papers for a correct finding.

In testing for bile with nitrous acid the reaction is not positive unless there is a green ring at the line of contact, other colors produced may be due to indoxyl or other compounds.

The results of tests for glucose often yield indications which seem positive but when other reactions are observed it is found that glucose is absent.

View must never be lost of the fact that Fehling's Solution made up for some time, even if kept in separate solutions will reduce in the absence of glucose, and it is for that reason that the solution is always boiled before adding the suspected material. The following modification of Haine's Solution suggested by the writer (Merck's Report, June, 1905) gives excellent results and possesses many advantages over Fehling's Solution :

Copper sulphate	30 grains.
Glycerin	4 fl. drachms.
Distilled water.....	4 fl. drachms.

Dissolve the copper sulphate in the water and add the glycerin.

Have on hand some liquor potassii hydroxidi U. S. P. and to employ the test add 12 minims of copper solution to one fluid drachm of the liquid potassa contained in the test-tube, heat to boiling and add gradually with a dropper from 6 to 8 drops of the suspected material. Not more than 8 drops should be added. Glucose is indicated by a yellow or yellowish-red precipitate. If as sometimes happens, there is a question as to whether or not sugar is present after employing the copper tests, and in cases where chloroform has been added as a preservative, the question cannot be regarded as finally disposed of until the phenylhydrazine reaction has been employed.

A very satisfactory method of employing this test is the following :

To 5 Cc. of the suspected urine add 5 Cc. of water, 1 Gm. phenylhydrazine hydrochloride and 2 Gm. sodium acetate ; shake well and heat on a water-bath for half an hour and then cool by placing it in cold water. If glucose is present the characteristic needles of phenylglucosazone crystals will be observed when some of the material is examined microscopically.

In the quantitative estimation of sugar by means of Fehling's Solution if the urine is diluted, say in the proportion of one volume of urine to nine of water, the results will be more nearly correct than if the undiluted urine is employed.

If Bartley's method, (Bartley's Clinical Chemistry, second edition, page 91), which is one of the most satisfactory volumetric methods for the estimation of glucose, is employed, using potassium ferrocyanide as an indicator, the results are very satisfactory, and there is no difficulty observing the end reaction.

In searching for indican in urine by means of Labarraque's Solution, care must be exercised and the reagent diluted sufficiently not to bleach the indigo-blue color, which is produced in a positive reaction.

A more satisfactory reagent is Obermayer's and is composed of strong hydrochloric acid containing 2 parts of ferric chloride in 1000. To employ this reagent mix with an equal volume of urine and add sufficient chloroform to form a layer. Mix by inverting the tube several times ;

(too violent shaking produces an emulsion), if the chloroform is colored blue indoxyl, so-called indican is present. The quantity is dependent on the intensity of the color.

Tests for acetone are not satisfactory unless the material to be tested is the distillate from the urine. By using a test-tube, sufficient material can be obtained to apply the necessary tests.

If Lieben's test (the formation of iodoform) is employed, it is well to remember that the materials employed also react positively with alcohol; if, however, ammonia water is substituted for the potassium hydroxide, this disturbing element is eliminated.

While the microscope is regarded as the most satisfactory means of detecting blood, there are occasions when it is tested for chemically. The reagents employed in this case are tincture of guaiac and oil of turpentine or peroxide of hydrogen. If oil of turpentine is employed it is essential that it should have been exposed to the air for a considerable time. On the other hand, the tincture of guaiac must be made up fresh each time and contain about 1 per cent. of guaiac. Pus gives a similar reaction, with the exception of the fact that the blue color produced by pus disappears when the mixture is heated, whereas the blood reaction is permanent. Due to the cheapness now of spectroscopes for blood work this method is rapidly replacing other tests for blood.

Pus, like blood, is most easily detected by the microscope, but very often it is tested for by adding a solution of hydrogen peroxide to the sediment, and if an effervescence occurs reporting pus. As a result of testing numerous ammoniacal urines which were free from pus and nevertheless produced an effervescence on the addition of hydrogen peroxide, I have no hesitation in condemning this as a test for pus in urine.

In determining whether or not a urine gives a positive Ehrlich diazo reaction the important considerations are first, the proper preparation of the solution, the best formula for which is the following:

Solution No. 1, containing sulphanilic acid, 2 Gm.; hydrochloric acid, 50 Cc.; distilled water, 1000 Cc.

Solution No. 2. $\frac{1}{2}$ per cent. solution of sodium nitrite. To apply the test mix 50 parts of No. 1 and 1 part of No. 2; to about 10 Cc. of this mixture add an equal volume of urine, make the whole strongly alkaline with ammonia water and shake thoroughly. The reaction is only positive if in addition to the liquid being carmine-red the foam is also of that color, and after standing twenty-four hours a greenish precipitate has formed.

In testing for albumin in the urine results are often unsatisfactory, due to a neglect to filter the sample before applying the tests. To guard against error it is a safe rule to filter every urine to which tests for albumin are to be applied.

The quantity of albumin present is often so small that in searching for an opacity it is not apparent if the urine is not perfectly clear before applying

the test. A very satisfactory method by which to clarify urine which will not filter clear is to make it strongly alkaline with solution of potassium hydroxide, shake thoroughly, filter until clear, and then acidify with acetic acid.

If the heat and nitric acid test is to be employed it must be remembered that an excess of acid in the presence of a small amount of albumin may produce an acid albumin which is soluble with the result that a faulty result is rendered extremely probable.

Heller's test, nitric acid employed by the contact method, is very frequently used, and if this procedure is followed it is well to remember that the pine acids and mucin often react in a manner which would indicate albumin to an inexperienced operator.

The method which simply heats some of the urine in a test tube without acidification is open to the objection that this operation precipitates both albumin and earthy phosphates so that it becomes necessary to add a few drops of nitric acid and observe whether the precipitate is dissolved. The phosphates are soluble, whereas the albumin is unaffected. Esbach's reagent a picric solution, which is the one employed in Esbach's albuminometer for the quantitative estimation of albumin is sometimes employed for the qualitative detection of albumin, but as picric acids reacts with alkaloids the reaction is not positive, unless the precipitate persists when the solution is heated. It is hardly necessary to call attention to the necessity of applying several tests for the detection of the various constituents sought.

A good routine method is to apply Tanret's test to some of the filtered urine and if a positive reaction is produced remember that alkaloids and peptones react positively with this reagent. Heat dissolves the precipitate produced by these substances, whereas the albumin does not dissolve. If another portion of the filtered urine is subjected to Purdy's test, a test-tube three-fourths filled with it and one-sixth of the volume of a saturated solution of sodium chloride added and the whole acidified with about 5 or 10 drops of 50 per cent. acetic acid and the upper portion of the mixture boiled, the smallest amount of albumin will produce a turbidity or a large amount a coagulation which can be easily and unmistakably recognized. This is a very satisfactory test which leaves little to be desired with regard to sensitiveness and trustworthiness.

Another very satisfactory test which is exceedingly sensitive and reliable is the potassium ferrocyanide test. If this test is employed it should be remembered that if the acetic acid is added directly to the urine as is often advised the mucin is precipitated and produces an opacity where no potassium ferrocyanide has been added and no albumin is present. To avoid this source of danger the test is best applied by adding to about half an ounce of urine in a test-tube about one-half drachm of 5 per cent. solution of potassium ferrocyanide mixing thoroughly and adding about 8 or 10

drops of 50 per cent. acetic acid. After the tube has stood for a few minutes the presence of albumin is indicated by the mixture assuming a milky appearance, which can best be observed by comparing it with a urine free from albumin to which the above reagents have been added.

These few notes are not submitted as a course of instruction in the chemical examination of urine, but merely to point out a few sources of error which experience as an instructor in the chemical laboratory of a college of pharmacy has proven are apt to lead to erroneous conclusions unless guarded against.

OPIUM ASSAY WITH USE OF LEAD SUBACETATE.

BY C. E. PARKER, WASHINGTON, D. C.

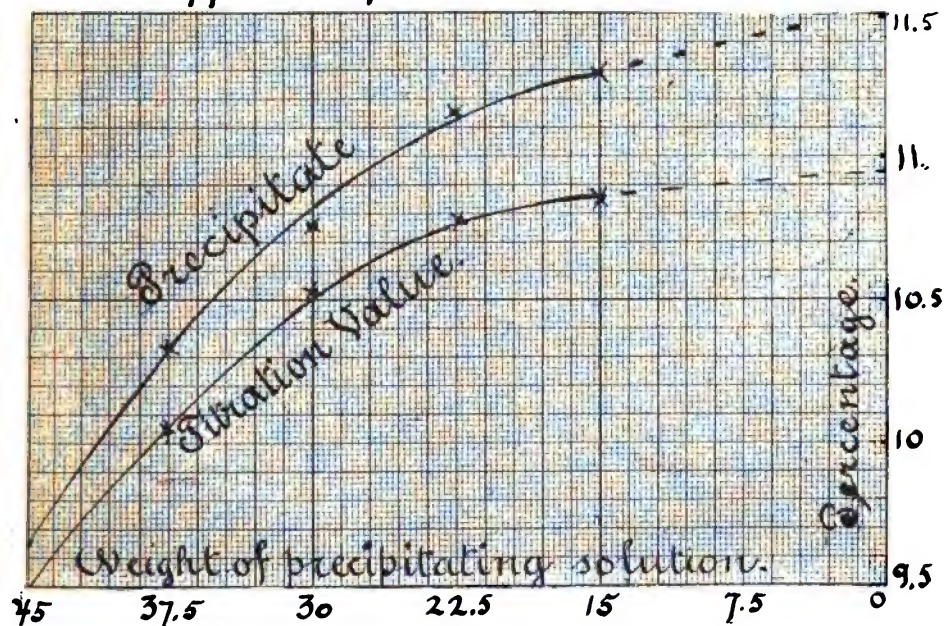
The United States Pharmacopœia, seventh revision (in force January 1, 1894, to September 1, 1905), prescribed a detailed method for the assay of opium, of which the following is an outline: Exhaust 10 Gm. of the drug with water, evaporate the extract to 20 Gm., add 10 Gm. of alcohol and 25 Cc. of ether, precipitate morphine with 3.5 Cc. ammonia water, collect the precipitate on a filter, wash, dry at 60°, weigh and compute as monohydrated morphine. The fact having been established in the meantime that the morphine thus obtained frequently contains much impurity, of which a considerable part is insoluble in lime water, the eighth revision of the Pharmacopœia adds the requirement that the weighed precipitate is to be treated with lime water, the insoluble residue filtered off, dried and weighed, and the latter weight deducted from the former, the soluble difference being computed as morphine.

While this addition is an undoubted improvement, it is not a complete solution of the difficulty. The color of the lime water filtrate indicates that a portion of the impurity is soluble, and there is indirect evidence that this may amount to 4 or 5 per cent. of the total precipitate; it is possible that the lime water reacts with a portion of the impurity (calcium ammonium meconate), so that the separated residue has neither the same composition nor weight as the impurity weighed with the crude morphine, and the correction makes the method somewhat tedious and unwieldy for technical purposes.

Of other proposed methods for determining the proper deduction for impurity in the morphine precipitate, probably none is superior to the lime water method. Other solvents have been tried, such as potassium hydroxide solution and ethyl and amyl alcohols, but none seem to effect a better separation of the impurity. The latter evidently varies in composition and amount, not only when derived from different samples of opium, but also in different assays of the same sample made by the same method, which suggest the need of better definition of the analytical details. It often contains calcium compounds (meconate and sulphate), and is capable of neutralizing strong acids, so that in a precipitate containing

impurity of this character titration of the morphine with acid is impracticable. The inorganic constituents are too variable to permit the use of a correction factor based on the ash. The most promising suggestion seems

Effect of Concentration.



to be that of Mallinckrodt, to re-assay the morphine by a modification of the old lime method, as follows :

Place 1.2 Gm. of mixed powdered crude morphine in an 80-Cc. Erlenmeyer flask, add 0.5 Gm. freshly slaked lime and 20 Cc. of water, cork and shake occasionally for one hour. Filter into a similar tared flask with gentle suction (reinforcing the point of the filter with a platinum or hardened paper cone), wash the flask and residue with lime water until the total filtrate and washings amount to 35 Gm. Add 3 Cc. of alcohol, 20 Cc. of ether, rotate, add 0.5 Gm. ammonium chloride, cork and shake vigorously. Let stand two hours, filter, dry and weigh the precipitated morphine according to the pharmacopœial direction.

The weights obtained in this manner are subject to correction. Experiments with pure morphine show a loss by solubility in the mother liquor of about 0.03 Gm. at a temperature of 25° to 30°C., and this amount may be added to the weight of the recovered morphine. The latter, however, is not necessarily pure. Mallinckrodt found that several repetitions of the operation may be required to eliminate all the impurity and obtain the yield corresponding to pure morphine, and estimated the purity of the (first) reassay morphine at about 98 per cent. If the original precipitate itself contained very little impurity the reassay morphine should be practically pure.

A number of efforts have been made to prepare the aqueous extract so

that pure morphine may be precipitated in the first instance. The solution is said to* contain sulphate and meconate of morphine and other alkaloids, calcium salts, meconic acid, extractives and resinous matter. It has accordingly been treated with barium chloride† to remove sulphuric acid, with ammonium oxalate‡ to remove calcium or with alcohol§ to remove extractive matter and calcium compounds. The latter, Lamar's modification, consists in treating the 20 Gm. of concentrated solution obtained by the pharmacopœial process with 60 Gm. of alcohol, filtering, washing, concentrating the filtrate and washings to 20 Gm. and proceeding as usual. It appears to possess decided merit, though it does not yield pure morphine nor as high results as the pharmacopœial method.

The possible usefulness of the lead acetates in removing the impurities having suggested itself, a number of experiments were made, of which a partial account follows:

The only previous work in this direction which was found recorded was by Dieterich,|| who tried to modify his well known assay process so as to obtain a colorless morphine precipitate. Mixing 1.25 Gm. of lead acetate with the magma formed by triturating 6 Gm. of opium with 6 Gm. of water, and proceeding as usual in the Dieterich method, a low yield of morphine was obtained; but by triturating 2.5 Gm. of lead acetate with the drug before adding water, about the same yield of morphine was obtained as without the use of lead acetate. Treatment of the opium-lead-acetate-water mixture with ammonium sulphide or hydrogen sulphide to remove lead caused loss of morphine. It does not appear that Dieterich tested the purity of the morphine precipitate, but as it was not colorless he proceeded no further.

The lead acetates may be expected to remove much of the extractive, resinous and coloring matter, organic and sulphuric acids, and possibly some papaverine and narcotine. The solutions employed were a 10-per cent. solution of crystallized lead acetate and the 25-per cent. pharmacopœial solution of lead subacetate.

Three lots of the drug were subjected to experiment; a granulated opium assaying about 17 per cent. morphine, the precipitate by the pharmacopœial method being 99.5 per cent. soluble in lime water, and two powdered opiums of approximately pharmacopœial strength (12 to 12.5 per cent.), which yielded by the same method a precipitate of which barely 90 per cent. was soluble in lime water. The latter two had been repeatedly assayed by a number of chemists using the same methods in the cooperative work of the Association of Official Agricultural Chemists, as

* Allen, *Com'l Organic Analysis*, vol. III, part II, p. 340.

† Dott, *Pharm. J.* April 1894, p. 847.

‡ Dott, *Pharm. J.* December, 1895, p. 497.

§ Lamar, *Am. J. Pharm.* January, 1900, p. 36.

|| Helfenberger *Annalen*, 1887, p. 54.

reported in the Proceedings of the Association,* which provided an excellent basis of comparison.

With the pharmacopœial method as a basis, preliminary experiments were made on the addition of various amounts of lead acetate and subacetate respectively, at different stages of the assay, the precipitate being filtered off and the filtrate freed from lead by treatment with hydrogen sulphide and filtration. In connection with the use of lead acetate in some instances the magma was shaken with lead carbonate to remove free acid before filtration. From the results of this work it was inferred that :

If properly washed the lead precipitate does not retain morphine.

Lead solution should be added until no further precipitate is formed.

The mixture may become slightly alkaline without precipitation of morphine.

The treatment is capable of removing much of the impurity which is insoluble in lime water.

Evaporation of the solution of morphine acetate is favorable to decomposition and darkening of the alkaloid.

From concentrated solution impurities soluble in lime water are precipitated, and another correction is desirable.

It would be desirable to have present during the evaporation sufficient of a non-volatile acid to displace acetic acid and form a salt with the morphine: but the salt in question must be very soluble, and the acid, even in concentrated form, must be incapable of injuring the alkaloid.

It was decided to try oxalic acid as fulfilling the indications of the last paragraph, and as lead oxalate is extremely insoluble in water, it was anticipated that by this agency all the lead might be removed, thus dispensing with the use of hydrogen sulphide. Incidentally oxalic acid also possesses the advantage of removing calcium, of which an additional amount appears to be brought into solution by combination with the acetic acid liberated from the lead acetate; it also precipitates papaverine from concentrated solution.

Continuing the experiments, the lead solutions were applied with various modifications of detail: triturated with the opium, shaken with the opium and water magma and mixed with the filtered aqueous extract respectively, increasing the amounts until the cessation of further precipitation indicated the presence of a slight excess. The addition of oxalic acid was also the subject of numerous experiments; it was added to the unfiltered mixture of opium, water and lead solution with the idea of filtering only once before collecting the morphine, as in the pharmacopœial process; it was added to the filtrate from the opium, water and lead solution mixture, the precipitate being filtered out, washed, and the filtrate and washings evaporated and precipitated; in other experiments the filtrate from the magma of opium and water was treated with lead solution and filtered, the filtrate treated with oxalic acid and filtered, the filtrate being

* U. S. Department of Agriculture, Bureau of Chemistry, Bulletins Nos. 99 and 105.

evaporated and precipitated. The amount of $\frac{N}{T}$ oxalic acid necessary for complete precipitation was noted, and a further amount (estimated) equivalent to the morphine present was added, on the basis of 1 Cc. to 0.301 Gm. of morphine. Precipitation was effected from 30 Gm. of hydroalcoholic solution, as directed by the Pharmacopœia, and also from solutions containing respectively 20, 18, 15 and 12 Gm. of the solution.

As a result of these experiments it was concluded that :

Lead subacetate removes more impurity than the acetate, and the use of the latter should be discontinued.

The use of oxalic acid is advantageous, removing much impurity, but a small amount, of lead is likely to remain in solution and contaminate the morphine precipitate, and at final treatment with hydrogen sulphide is therefore necessary. This is somewhat surprising, as the solubility of lead oxalate in water is said to be only 1.5 parts per million.†

The successive addition of subacetate solution and oxalic acid directly to the opium and water mixture is an impracticable feature, as it is difficult to judge when the proper amounts of the respective solutions have been added, and the following filtration is very tedious.

A better way is to add the oxalic acid to the filtrate from the mixture of opium, water and lead solution, filter and wash the precipitate, evaporate the combined filtrates to about 20 Cc., treat with hydrogen sulphide and filter. Wash the precipitate with hot water, evaporate the filtrate and washings, transfer to a 100 Cc. flask and dilute to the proper concentration for precipitation of morphine.

The final solution prepared in this manner is divested of much of the extractive and other impurities which ordinarily embarrass the precipitation of morphine, as its color, mobility, etc., testify, and it is possible, therefore, to effect the precipitation in a more concentrated solution and with less loss in the mother liquor. Nevertheless, some impurity still remains which contaminates the precipitate to a slight extent, increasing with the concentration. This is probably an example of adsorption.

The impurity is soluble in lime water, but does not neutralize acid: acid titration of the precipitate (in the absence of basic impurities) gives a closer approximation to the true morphine content than the lime water correction does.

In order to realize any advantage from precipitation in more concentrated solution it is necessary to titrate the precipitate, which requires less time than the lime water correction. Somewhat higher results may be obtained by this modification.

The weights precipitated from concentrated solutions will not be very concordant unless the precipitate is washed with special care. Reduction of the volume of the mother liquor reduces the loss by solubility of morphine therein, but it is not possible to reduce the volume of the solutions used for washing to any extent: on the contrary, the tendency is for more washing to be necessary as the concentration of the mother liquor is increased, and the precipitate becomes more contaminated. To minimize loss in the washing solution, the water which the Pharmacopœia directs for that purpose should be saturated with morphine. Though but slightly contaminated, the precipitate may be quite dark in color, and remain so in spite of thorough washing.

- The method finally adopted as most suitable for the samples of opium which were the subject of experiment was as follows :

* Schmidt, Pharm. Chemic, Vol. II, ii, pp. 1492, 1518.

† Kohlrausch, Z. physik. Chem. 50, 356.

Introduce 10 Gm. of the opium into a 300 Cc. flask, add 100 Cc. of water, cork and shake for two and one-half hours: add 25 Cc. of lead subacetate solution, cork and shake for one-half hour. Filter through a wetted filter 12 Cm. in diameter, and wash the residue carefully with water until the total filtrate amounts to about 175 Cc. Return the residue to the flask, add 50 Cc. of water, cork, shake about ten minutes and return the whole to the filter, washing the residue until the second filtrate amounts to about 150 Cc. Combine the two filtrates in a beaker and from a burette, add normal oxalic acid solution, at first in portions of about 5 Cc. at a time, stirring and allowing to settle after each addition, and then more slowly, until the point where precipitation just ceases is reached (about 26 Cc.): then add 5 Cc. more, or 1 Cc. for each 3 per cent. of morphine if the approximate amount is known. Filter the solution, wash the precipitate with water, and evaporate the filtrate in flat-bottomed dishes to a volume of about 20 Cc., uniting the whole in one dish when the volume is sufficiently reduced, and rinsing carefully after with water. Treat the concentrated solution in the dish (facilitated by slightly tilting the latter) with hydrogen sulphide, and filter through a 5 Cm. paper, washing the dish and filter after into a small evaporator, with a minimum amount of hot water. Evaporate to small volume (somewhat less than that finally required), transfer to a tared 100-Cc. flask, rinsing after with a minimum amount of hot water, and add water to bring the weight to 10, 15 or 20 Gm. as may be desired. Add 5, 7.5 or 10 Gm. of alcohol, as the case may be, rotate, add 25 Cc. of ether, rotate again and add 2 Cc. of ammonia water (10 per cent.), or a moderate excess. (Cork the flask, shake and suspend a strip of dry, neutral litmus paper under the cork; it should turn blue in about 1 minute. Cork, shake vigorously for ten minutes and set aside for 12 hours or over night in a cool place.)

Filter through double counterpoised filters and wash, dry and weigh as directed by the Pharmacopœia, except that a saturated solution of morphine in water is used instead of pure water for washing the precipitate. The precipitate, or a weighed portion of it, is dissolved in a known amount of decinormal acid, and after addition of cochineal indicator, is titrated back with fiftieth-normal potassium hydroxide solution.

If shallow, flat-bottomed evaporators are used, it appears practicable to dispense with the precaution of evaporating the weak filtrate first to small volume, then adding the strong filtrate and continuing the evaporation. By thus treating the whole solution with oxalic acid in one operation the manipulation is much simplified, and no grounds were found for suspecting that evaporation in the manner described leads to any loss of morphine.

In the final stages of the work a powdered opium was employed which in the coöperative work of 1906 had given the following results:

	U. S. P. Method.	Lamar Method.
Number of assays averaged.....	27	20
Precipitate.....	12.32 per cent.	10.87 per cent.
Purity by lime water.....	87.82 per cent.	96.60 per cent.
Purity by re-assay.....	81.55 per cent.	89.20 per cent.
Morphine by lime water.....	10.76 per cent.	10.50 per cent.
Morphine by re-assay.....	9.96 per cent.	9.70 per cent.

If the re-assay morphine in the above results is assumed to be 98 per cent. pure (Malinckrodt) and 0.030 Gm. is added as correction for alkaloid lost in the re-assay mother liquor, the above re-assay values will be changed to—

Purity by re-assay.....	82.40 per cent.	89.90 per cent.
Morphine by re-assay.....	10.15 per cent.	9.77 per cent.

A number of assays were made by the lead subacetate method to determine the effect of varying concentration of the solution in which precipitation is effected, the latter being always adjusted to contain approximately 33 per cent. of alcohol :

Amount of solution.	Amount of precipitate.	Purity by titration.	Morphine by titration.
45 Gm.	9.646 per cent.	98.40 per cent.	9.49 per cent.
37.5 Gm.	10.33 per cent.	97.25 per cent.	10.05 per cent.
30 Gm.	10.75 per cent.	97.52 per cent.	10.53 per cent.
22.5 Gm.	11.15 per cent.	96.71 per cent.	10.78 per cent.
15 Gm.	11.296 per cent.	96.10 per cent.	10.85 per cent.

These results, especially those obtained with 30 Gm. of hydroalcoholic solution (the pharmacopœial concentration), may be compared with the co-operative average results.

On plotting the results by coördinates referred to the amounts of the solutions in which precipitation is effected and the yields, curves corresponding to the precipitates and the titration values are obtained. These curves show that the loss by solubility in the mother liquor is not strictly proportional to the amount of the solution, but with decreasing amounts the solubility of the precipitate also decreases. This is probably due to the increasing concentration of other non-precipitable material in the solution. The amount of this material in the present case is about 2 Gm., while when the pharmacopœial method is followed it amounts to about 3 Gm., and the solution in the latter case is of decidedly thicker consistency, even in proportionate dilution. The volume or weight of the precipitating solution is considered a satisfactory basis of comparison, though it does not exactly correspond to the amount of solvent or of mother liquor. The addition of excess of ether and of 2 Cc. of ammonia water affects the volume and composition of the solution, and an allowance of 3 Gm. might be made for total solids in solution. For example, 15 Gm. of hydroalcoholic solution containing 3 Gm. of solid matter dissolved, to which 2 Cc. of ammonia water are added; the total solvent is about 14 Gm. and the mother liquor is about 16 Gm.

It would, of course, be impracticable to reduce the amount of the precipitating solution much below 15 Gm., but the direction of the curves suggests the speculation that if the amount could be reduced to zero and the loss in the mother liquor eliminated, the maximum of the titration value would be about 10.95 per cent.

Some typical results by the lead subacetate method were as follows :

From 30 Gm. of hydroalcoholic solution.

	On filter.	On watch glass.
Precipitate.	10.822 per cent.	10.754 per cent.
	10.755 per cent.	10.725 per cent.
	10.744 per cent.	10.903 per cent.
	10.956 per cent.	10.904 per cent.
Average.	10.824 per cent.	10.772 per cent.
Loss drying at 110° C.	6.30 per cent.	0.30 per cent.

Purity.	Ash Morphine
By lime water.....99.10 per cent.	By lime water.....10.68 per cent.
By titration .....97.50 per cent.	By titration .....10.55 per cent.
By re-assay .....97.54 per cent.	By re-assay.....10.56 per cent.

The re-assay results (including a correction of 0.030 Gm. for solubility in the mother liquor) usually agree quite closely with the titration results.

The titration value of the precipitate from 15 Gm. of solution seems to approximate closely to the total morphine of the opium, and the weight of the precipitate from 30 Gm. of solution with no correction averages practically the same.

It is probably too much to expect that a method developed from experimentation with such a limited number of samples will prove satisfactory with all varieties of opium. A more general experience will, perhaps, show that modifications are desirable. In its present form the method seems short and simple enough for technical purposes, requiring somewhat less time than the pharmacopœial method. It may also provide a basis of comparison and criticism of other methods.

A MECHANICAL AGITATOR FOR DRUG ASSAYING.

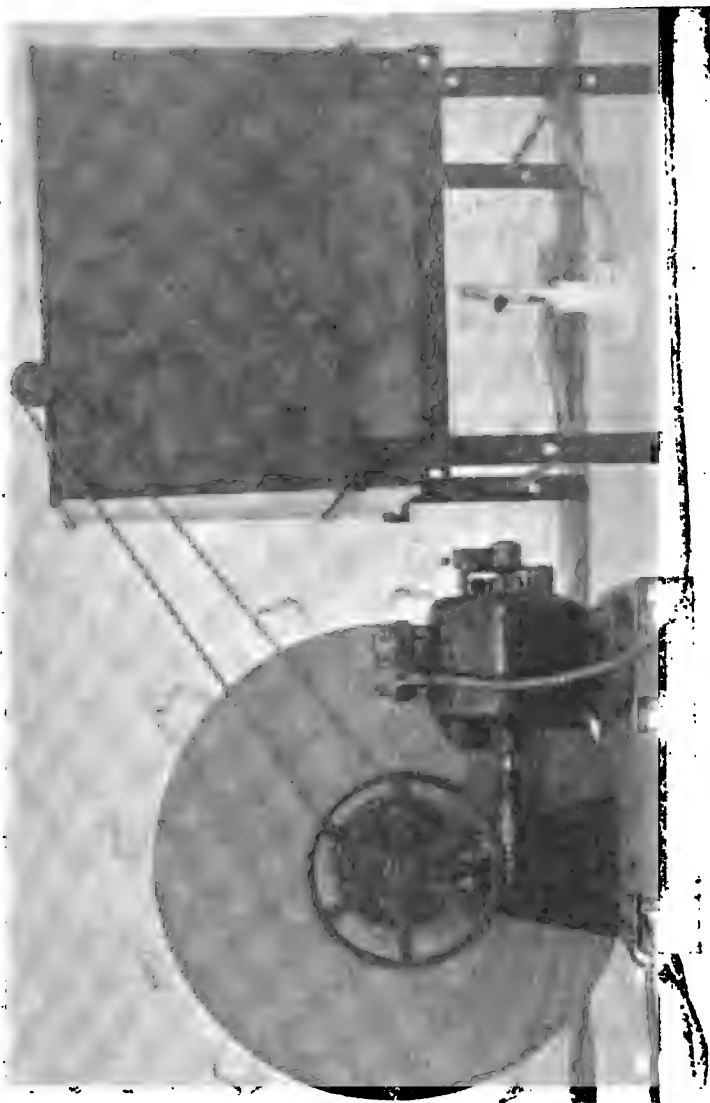
BY C. E. PARKER, WASHINGTON, D. C.

In the pharmacopœial methods for the assay of vegetable drugs, the preliminary extraction of active principles is usually effected by maceration with suitable solvents, accompanied by a more or less definite amount of agitation.

The direction to shake at frequent intervals during a certain period often occurs, with the alternative in a few cases of shaking continuously in a mechanical shaker. In the interest of uniformity and of convenience where much assaying is done, it seems desirable to shake continuously by mechanical means in all such cases.

A simple appliance designed for this purpose and constructed for the Drug Laboratory consists of a small electric motor, which by means of a worm gearing rotates a wooden disk about a horizontal axis at a speed of about 20 revolutions per minute. The disk is provided upon its face with 12 spring clamps which securely hold the maceration flasks. Ordinary cylindrical 8-ounce nursing bottles are found convenient for this purpose.

A modification of this apparatus produces the intermittent agitation required for the pharmacopœial pepsin assay by inverting the bottles once every ten minutes. The bottles containing the pepsin assays are placed in clamps on a rotatable shaft in a constant temperature water bath. This shaft is rotated by a chain and sprocket wheel connection, the sizes of the sprocket being so proportioned that a half revolution of the wooden disk first mentioned produces a complete revolution of the pepsin assay bottles. In order to produce exactly a half revolution of the disk at 10-minute intervals separate devices for starting and stopping the motor are employed. The current (from an ordinary incandescent lighting circuit) is led to a commutator which is rotated once an hour by an insulating con-



Mechanical Agitator for Drug Assaying.

nection from the minute arbor of an ordinary brass clock. The commutator is provided with six equidistant contact points which are alternately connected together in two sets of three, the two sets connecting with the motor by two parallel branch circuits. Thus the current is admitted to the motor through the two branches alternately at 10-minute intervals. The interrupter is placed on these branch conductors. It consists of a small cam on the disk shaft which alternately lifts circuit breakers in the two branch circuits at diametrically opposite points in its rotation, and while breaking the current in one conductor, and thus stopping the motor, leaves the other branch conductor ready to carry the current when the commutator closes the circuit at the following contact point. The clock starts the mechanism every ten minutes and the latter automatically shuts off the power when the disk shaft has made a half revolution, and the pepsin assay bottles have been rotated (or inverted) once, as the Pharmacopœia directs.

To check the momentum of the apparatus and produce positive stopping when the current is shut off, it has been found desirable to provide a brake for the motor shaft. A magnet through which the motor circuit passes withdraws the brake from contact with the shaft against which it is pressed by a spring when the circuit is broken.

The writer desires to acknowledge his indebtedness to Dr. L. J. Briggs of the Bureau of Plant Industry for suggestions regarding the automatic feature of this apparatus.

DATA RELATING TO FLUIDEXTRACTS.

BY JOSEPH FEIL, PH. G., PHAR. D., CLEVELAND, OHIO.

The data given below relating to fluidextracts have been compiled and worked out for the following purposes :

1. As a reference list illustrating a period in pharmacy that has no counterpart in the past nor is likely to be ever duplicated in the future. This of course refers only to that part of the table containing the approximate percentages of alcohol in fluidextracts as given on the labels of these preparations made by prominent manufacturers.

2. For the purpose of comparison with a table of more or less like import which I expect to present next year showing the result of the workings of the Drug and Food Act, and if the law remains as it is at present, giving a basis for a better understanding of the requirements of proper menstrua for these preparations.

3. Fluidextracts frequently remain in stock of retail pharmacies for prolonged periods, as the demand for certain ones is comparatively small. This list and the one to be published in the future, will enable pharmacists to know approximately the quantity of alcohol in these galenicals. As is well known, the jobbers' stocks have all been labeled by the interested manufacturers.

4. An attempt at an approximate estimation of alcohol in these preparations. As the law requires, after October 1st, an exact statement of the quantity, the figures given can be compared and the method thoroughly tried out as to its practical value. I believe, as stated in my paper last year, that it is possible to calculate the result within two per cent.

5. Data as to moisture and extractive matter in drugs are widely scattered and very variable in reliability. I have collected these statements from every available source, confirmed some, made quite a number of new determinations, and in some instances averaged several apparently reliable determinations.

6. While the amount of moisture in drugs is remarkably uniform averaging about eight per cent., the extractive is far more variable. Yet nearly all manufacturers are compelled to standardize their fluidextracts by a certain percentage of extract, as only 14 of the 89 official preparations are assayed by the U. S. P. VIII methods, and 7 more are generally assayed by the manufacturers, hence it follows that these galenicals are far more uniform in the extract contents as found in the market than the statements in regards to their percentage as given in various pharmaceutical treatises would indicate.

7. The table also indicates that in some instances the manufacturer's menstruum is radically different from that ordered by the U. S. P. VIII. I believe these variations are worthy of careful study, as the manufacturer is very anxious to turn out the best quality of preparations and if he changes the menstruum it is only after careful and prolonged experiments.

EXPLANATION OF TABLE.

1, 2, 3, 4, 5. These columns contain the amount of alcohol which is the limit it may contain, printed on the labels of five prominent manufacturers. I copied these numbers in most cases from the original packages. In three cases I obtained the information, partly, from provisional lists.

6. Actual amount of absolute alcohol by volume in initial menstruum directed by the U. S. P. VIII.

7. Amount of moisture in the ground drug, determined at 105° C.

8. Average amount of extract, compiled and determined as stated above.

9. Alcohol remaining in the finished preparation, calculated by assuming that 100 Gm. extract equals 60 Cc. volume. This is not true in every case but for this approximation is sufficiently exact. The extractive will measure from 50 to 70 Cc.

10. The average of columns 1-5 for comparison with column 9.

11. The difference between 9 and 10. It is curious to note that the quantity stated by manufacturers is, except in rare instances, too high, and the excessive amount indicates that the moisture in the drug was usually considered a negligible quantity, whereas it is apt to be as great a factor as the extractive.

DATA RELATING TO FLUIDEXTRACTS.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1 Aconite	70	65	70	60	65	71.2	8.3	16	57	66	9 per cent. too high.
2 Apocynum	60	50	55	50	50	56.9	8.3	14	45	53	8 per cent. too high.
3 Aromatic	85	85	85	85	90	94.9					
4 Belladonna Root.....	70	70	70	65	70	75.9	8	10	64	69	5 per cent. too high.
5 Berberis	45	40	45	40	45	48.9					
6 Bitter Orange Peel..	45	55	50	55	50	56.9	9	30	42	51	9 per cent. too high.
7 Buchu	70	65	65	60	65	71.2	9.5	15	57	65	8 per cent. too high.
8 Calamus	70	85	65	60	65	71.2	13	24	52	69	17 per cent. too high.
9 Capsicum	85	90	85	85	85	94.9					
10 Cascara Sagrada.....	35	25	30	30	25	38.	7.8	24	28	28	Agrees.
11 Cas. Sag., Arom.....	25	25	30	30	25	23.7					
12 Chimaphila	45	40	40	40	40	48.9					
13 Chirata	40	45	40	40	45	48.9					
14 Cimicifuga	70	65	85	85	65	94.9	11.2	15	74	74	Agrees.
15 Cinchona	75	65	60	65	50	75.9	7	20	61	63	2 per cent. too high.
16 Coca	40	40	40	40	40	48.9	8	25	36	40	4 per cent. too high.
17 Colchicum Seed.....	70	55	55	55	45	50.0	8.7	20	44	56	12 per cent. too high.
18 Conium	45	40	40	40	45	48.9	7.5	28	34	42	8 per cent. too high.
19 Convallaria	45	55	50	55	50	61.7	7	33	44	52	8 per cent. too high.
20 Cubeb	80	75	75	85	85	94.9	5	20	75	78	2 per cent. too low.
21 Cyathodol	45	40	45	40	50	48.9					
22 Digitalis	55	50	45	40	40	48.9	8.9	24	35	46	9 per cent. too high.
23 Ergot	45	40	45	40	25	48.9					
24 Erodactylon	70	65	60	65	60	75.9	7.6	32	53	64	11 per cent. too high.
25 Eucalyptus	70	80	70	60	60	71.2					
26 Euonymus	45	40	45	65	60	75.9					
27 Eupatorium	30	40	40	50	40	48.9					
28 Frangula	25	20	30	30	30	36.5					
29 Gelsemium	85	85	80	85	65	94.9	7.2	12	78	80	2 per cent. too high.
30 Gentian	40	40	40	40	35	48.9	12	31	33	39	6 per cent. too high.
31 Geranium	70	40	50	55	35	56.9					
32 Ginger	85	85	85	85	90	94.9					
33 Glycyrrhiza	25	25	25	25	20	18.9	9	25	15	24	9 per cent. too high.
34 Grindelia	70	65	65	60	60	71.2					
35 Guarana	55	50	55	40	60	48.9					
36 Hamamelis	35	40	25	30	25	28.4					
37 Hydrastis	40	50	50	55	50	56.9	8.3	23	45	51	6 per cent. too high.
38 Hyoscyamus	70	50	60	55	60	63.2	8.1	22	47	59	12 per cent. too high.
39 Indian Cannabis	85	85	85	85	75	94.9	8.7	13	78	83	5 per cent. too high.
40 Ipecac	35	35	65	30	70	71.2	9.6	12	57	38	19 per cent. too low.
41 Krameria	70	40	40	40	40	48.9					
42 Lappa	45	40	45	40	40	48.9	8.7	24	37	42	5 per cent. too high.
43 Leptandra	70	60	60	50	65	71.2	12	16	55	61	6 per cent. too high.
44 Lupulin	80	80	80	80	80	94.9					
45 Matico	70	65	65	60	60	71.2					
46 Mezereum	70	65	65	70	65	75.9	8.2	12	62	67	5 per cent. too high.
47 Nux Vomica.....	85	60	65	60	60	71.2	7.5	14	58	66	8 per cent. too high.
48 Pareira	70	55	50	50	50	56.9					
49 Phytolacca	60	55	55	50	50	48.9	7.7	17	37	54	17 per cent. too high.
50 Pilocarpus	45	45	40	40	45	48.9	7.8	23	37	43	6 per cent. too high.
51 Podophyllum	75	65	70	65	60	75.9	7	14	63	67	4 per cent. too high.
52 Pomegranate	45	40	35	35	45	47.7					
53 Quassia	30	25	30	25	25	31.6	11	5	27	27	Agrees.
54 Quercus	45	40	40	40	45	42.7					
55 Quillaja	45	35	40	40	35	48.9					
56 Rhubarb	70	60	65	65	60	75.9	16	40	45	64	19 per cent. too high.
57 Rhus Glabra	45	40	40	40	35	42.7					
58 Rose	45	40	40	40	35	42.7					
59 Rubus	75	40	40	40	40	48.9					
60 Sarsaparilla	30	25	30	30	45	31.6					
61 Sarsap. Comp.	30	40	35	40	35	42.7					
62 Savin	85	90	80	85	85	94.9					
63 Scopola	60	65	60	65	60	75.9					
64 Scutellaria	45	40	45	40	45	48.9					
65 Senega	60	40	45	55	45	63.2	6	24	49	48	1 per cent. too high.
66 Senna	45	40	40	30	50	48.9	5	29	37	41	4 per cent. too high.
67 Serpentina	70	65	65	65	70	75.9					
68 Spigelia	45	40	40	40	40	48.9					
69 Staphisagria	85	90	85	85	85	75.9					
70 Stillingia	50	40	45	40	40	48.9					
71 Stramonium Leaves.....	45	50	50	55	55	63.2	8	17	52	51	1 per cent. too low.
72 Sumbul	85	80	85	80	80	71.2					
73 Taraxacum	30	40	35	40	25	48.9	16	11	37	34	3 per cent. too low.
74 Triticum	25	25	25	30	25	23.7	16	11			
75 Uva Ursi	40	30	18	25	40	23.7	14	25	17	33	16 per cent. too high.
76 Valerian	60	60	65	60	65	71.2	13	24	58	62	4 per cent. too high.
77 Veratrum	85	80	85	80	90	94.9	11.6	18	71	84	13 per cent. too high.
78 Viburnum Opulus ..	60	55	55	55	55	63.2	7.6	15	53	57	4 per cent. too high.
79 Viburnum Prunif....	40	65	60	55	55	63.2					
80 Xanthoxylum	80	65	60	65	60	71.2					

SCOPOLA VERSUS BELLADONNA.

BY A. R. L. DOHME.

The proposition propounded by this title is one that is growing in importance and interest because of the increasing scarcity of belladonna and the greater therapeutic power of scopola. The question as to whether scopola is to be used indiscriminately in place of belladonna is one that is based on the questions of inherited prejudice and lack of sufficient agitation on the subject. Whenever we have been raised upon an established belief that one drug is standard and that any other similar drugs are different from it botanically or physically, the latter are at once regarded as adulterations or dangerous interlopers. We had the same experience with Rio and Cartagena ipecac, and it required ten years of agitation and reiteration to convince the drug trade that both are equally valuable expectorants and emetics. The cases of long and short buchu and of socotrine and Curaçoa aloes are strictly parallel, and all of you remember as well as I the time when it was considered heresy for any one to talk of short buchu or Curaçoa aloes in the same breath with long buchu or socotrine aloes. To have used short buchu or Curaçoa aloes in one's preparations was to have invited sure disaster to one's preparations and reputation. The trouble was that the criterion at the time was not the facts as to the constituents of the drugs, but the inherited dictum of the preceptor in the drug store, the professor in the college or the drug expert in the drug importer's office. People judged from what they heard reported and said by those older than they, and unfortunately the latter judged not from a chemical study of the drugs but from what they arbitrarily believed. They were perfectly honest in their conviction, and it was no fault of theirs that chemistry had not yet taken up and brought out the facts concerning these drugs. Now we live in an age where such facts are fast coming forward, and in the case of scopola they are ample to justify the conclusion that scopola can be indiscriminately used for belladonna. I do not maintain that the case of scopola versus belladonna will go as far as did the cases of buchu and aloes, when the standards of yesterday were not only replaced by those of to-day, but were superseded by them. Who hears of long buchu or socotrine aloes to-day except in name? Long buchu is certainly a back number, and wherever socotrine aloes still appears on a label it perjures itself, for Socotra probably never saw what is concealed beneath the label. In case of belladonna both this and scopola will continue always to be used, as both possess real and absolute value as botanical and chemical and therapeutic entities. What I claim is that the odium should be removed from scopola, and that it should be allowed to be used indiscriminately for belladonna, and for the following reasons:

(1) The alkaloids of both are the same, and neither contains any marked preponderance of the so-called scopolamine, an alkaloid which was wrongly so called by Schmidt, since it is identical with hyoscyne, and has been so

admitted to be by Schmidt himself and every one else. What both drugs contain mainly, and on what their therapeutic efficiency depends, is hyoscyamine, although both contain besides some atropine and hyoscine. We know that hyoscyamine and atropine produce practically the same effect therapeutically, and both being only isomeric modifications of the same molecule, hyoscyamine being the stabler form, and the one hence occurring in nature, but changing readily into atropine in the process of manufacture or in the human economy. The only difference between scopolia and belladonna chemically is that scopolia contains usually more of the mydriatic alkaloids, and is hence usually a more powerful drug, but be it not forgotten that scopolas are not uncommon that are low in alkaloids and belladonnas are not uncommon that are rich in alkaloids. Besides this, the assay levels all inequalities of this kind, and the fact that scopolia is richer usually in alkaloids than belladonna is distinctly an advantage it possesses for the pharmacist and physician over belladonna.

(2) Authorities state that they are equally efficient, or that scopolia is more so, but similarly so, e. g., Cushny says scopolia produces as much or more narcotic effect than belladonna. Sir Dyce Duckworth examined the drug scopolia in pleurisy, rheumatic fever and chlorosis, and warmly recommended the use of scopolia in place of belladonna. The Extra Pharmacopœia (British) says that given internally scopolia causes less dryness of the throat than belladonna, and is probably more nearly allied to hyoscyamus in its action. Dunstan and Chaston found the same alkaloids in both drugs, consisting principally of hyoscyamine with a very small amount of hyoscine, and besides, in both drugs, found cholesterine and a fluorescent principle. Lauder Brunton also found that scopolia was fully equal, if not superior, to belladonna, when employed in cases where belladonna was indicated. All the dispensatories in this country state that scopolia is practically identical in chemical makeup to belladonna, and both E. M. Holmes, the great botanist of Kew Gardens, and Prof. Greenish of England, state that botanically, a very close resemblance is apparent in both scopolia and belladonna root, and that scopolia stands as a link between belladonna and hyoscyamus. Squires Pocket Compend (London) says scopolia has the same medicinal properties as belladonna and hyoscyamus. Some work that was done by the U. S. P. Revision Committee on therapeutics also showed that for liniment, ointment and plaster, scopolia gave, if anything, better results than belladonna, certainly fully as good results.

(3) To say that the drug is official and can hence be used, is not to the point, since it will require years to educate the physician and public up to accepting the one for the other, or at all. It is, of course, mainly in the matter of plasters that this question crops up, and it comes up at this time very pointedly, since the Pure Food and Drug Act would regard the use of scopolia for belladonna as a violation of the Act. Plaster manufacturers

cannot use scopola extract in their belladonna plasters, and the result is that the demand for belladonna has become so great that its price is very high and it is very difficult to obtain. In the meantime, the valuable scopola is being ignored in this country, although, of course, used all the more in other countries, due to the difference in price and the great ease with which it can be obtained. If a plaster manufacturer were to put upon his plaster "scopola plaster," he could not sell it, no matter how much he stated all over the label that it was equally efficient, or more so. The public and the drug trade have been educated to regard belladonna plaster as a standard, and scopola will not pass muster. If the plaster manufacturer could use "belladonna" as a name and still employ scopola or belladonna in his plaster, the question would be solved.

This can be done by the Revision Committee without violating any principle, or establishing a new precedent, follows from the fact that as aloes the manufacturer or pharmacist is allowed to use "the inspissated juice of the leaves of *Aloe vera*, *Aloe chinensis*, *Aloe Perryi*, or other species of *aloe*," and as ipecac, he is allowed to use "the dried root of *Cephaelis Ipecacuanha*, known commercially as Rio ipecac, or the corresponding portion of *Cephaelis acuminata*, known commercially as *Carthagena ipecac*"; and as veratrum, he may use "the dried rhizomes and roots of *Veratrum viride* (American hellebore), or *Veratrum album* (white hellebore);" and as sarsaparilla, he may use "the dried root of *Smilax medica*, or a dried root known commercially as Honduras sarsaparilla," which is probably obtained from *Smilax officinalis*; or as coca he may use "the dried leaves of *Erythroxylon Coca*, known commercially as Huanuco coca, or of *Erythroxylon truxillense*, known commercially as Truxillo coca, etc." Certainly it would be as correct, as justified and as advisable to say under *Belladonnæ radix*, "the dried root of *Atropa Belladonna*, or the dried rhizome of *Scopola carniolica*, yielding when assayed, as directed below, not less than 0.5 per cent. of mydriatic alkaloids," as to say the same, or even worse things for aloes, ipecac, veratrum, sarsaparilla or coca.

As far as my experience goes, and it is quite extensive, covering a period of about ten years in the handling and study of scopola, I have been unable to find any difference in the nature of the two drugs, or their preparations. If the U. S. P. can afford to class under one caption *Aloe Perryi*, *Aloe chinensis*, or other species of aloes, which lets open the door to all aloes, and I believe wisely and correctly so, then surely it would require no stretch of imagination, nor a twinge of the conscience to class under the caption "*Belladonnæ radix*," both belladonna and scopola roots. I certainly hope that it will be done, for scopola is too important and valuable a drug to be put on the shelf until the trade and the public are educated up to accepting the one or the other indiscriminately.

THE FOOD VALUE OF PREDIGESTED FOODS.

BY A. R. L. DOHME AND H. ENGELHARDT.

As there are many predigested food products upon the market, and as there is a distinct demand for them in medicine, and as no doubt there are many dishonest preparations being foisted upon the medical profession and the pharmacist, it was desirable for the Council of Pharmacy and Chemistry of the A. M. A. to test them in the laboratories of its chemists. The result of this work was published in the "Journal" of the A. M. A. of May 11, 1907, and no doubt represents a great deal of careful and painstaking work. There are, however, some points in reference to this work which are open to criticism, and it is the purpose of this paper to criticize the method and the results.

Firstly, it is very questionable whether the amount of calories is a correct criterion of the value of a food product, as the giving of calories does not necessarily indicate the absorption into the system of tissue building material. Strangely enough also the presence of sugar in a product by this method makes the product valuable as a food, and cheaper than those not containing sugar, of course, since sugar is about as cheap a product as can be used in medicine. Surely a product bolstered up with sugar, and giving in consequence a high number of calories, and hence rated high as a predigested food, and correspondingly cheap per dose, and hence, also rated desirable for a patient, should not in fairness, nor in correctness, be rated as high or as valuable as a product made principally from nitrogenous foodstuffs and other products that go to make up the usual food of men. The ignoring of glycerin likewise entirely as being of no value as a food, and hence not counting its calories at all, is not entirely just, since it is not by any means admitted that glycerin possesses no food value. Knapp (*Allgemeine Chemiker Zeitung*, 1907, No. 16) reports from experiments that glycerin has a decided nutritive value. Before ignoring it entirely, and being hence unjust to those products that contain it, it would perhaps have been best to determine by experiment whether or not glycerin has a food value. We know that alcohol has a food value, and glycerin being a triacid alcohol, and being also closely related to the well-known fats—lard and butter, which are mixtures of the stearates, palmitates, oleates, butyrates, etc., of glycerin, would quite likely by its very composition, possess a food value, since these fats in order to be absorbed are saponified into salts of fatty acid and glycerin, which is found free in the alimentary canal, where it unites with the phosphates of the food to form glycerophosphates, which is a stage in the formation of lecithin. (Beneke and Hallibutton *Text-book of Chemical Physiology and Pathology*, page 70.) Glycerin undoubtedly causes an increase of the amount of glycogen, the food stored up in the liver and continually supplied to the system by the hepatic vein. (Weiss, Luchsinger, Salomon.) E. Pflueger (*Pflueger's Archiv*, 42, page 144) says, "A living liver free from glycogen will again

form that substance, not only from carbohydrates, but from gelatin, proteid, or from glycerin." Hence, the method adopted by the Council places a premium upon those products containing added cane sugar or glucose or some other sugar, discredits those that contain glycerin, and gives credit to those that cost less per dose (due to their containing sugar).

What should have been the correct criterion is the amount of digested, *i. e.* soluble proteid nitrogen, peptone or albumose, since this can only be obtained by actually digesting and rendering soluble and absorbable the elements in foods that represent the true tissue and blood building elements, and can also be determined readily. We do not mean to say that carbohydrates are not essential as well, but it is impossible, or very difficult, to separate the carbohydrates that resulted from food predigestion, from those that resulted from the addition of syrup.

It is commendable in every sense to throw the limelight upon all fake products, and to make known to the medical profession, and to the public, which products of any sort are valueless or unfit for use as medicine or food. It is, however, not commendable to adopt such standards and methods as are unfair to some honest products, as I believe this tabulation is and can be shown to be.

To show how the standpoint or method of analysis affects the result, compare the tabulation and grading of these products by the Council of Pharmacy and Chemistry's criterion of sugar and cost per dose, with those obtained by Dr. Harrington of Harvard, in the Boston Medical and Surgical Reporter some four years ago. The order is just about reversed, because Dr. Harrington gauged the value of the products by their total solids, proteid nitrogen in the form of peptones and alcohol, laying the principal stress upon the proteid nitrogen. Products that stand high by the peptone test stand high in Harrington's table of comparative results, while products that are full of sugar stand high in the table of comparative results of the Council of Pharmacy of the American Medical Association. Which of the two methods of estimating the food value of these predigested food products is more nearly correct we will gladly leave to the pharmacist or physician who reasons independently before he concludes.

Baltimore, August, 1907.

MINUTES

OF THE

SECTION ON COMMERCIAL INTERESTS.

FIRST SESSION—THURSDAY MORNING, SEPTEMBER 5, 1907.

The first session of the Section on Commercial Interests was called to order by Chairman H. S. Kniseley, of Checotah, Ind. Terr., at 10 a. m.

In the absence of the Secretary, Mr. Chas. H. Avery, upon motion of Mr. Hynson, duly seconded, Mr. Frank H. Freericks, of Cincinnati, was elected temporary secretary, and proceeded to fill the duties of that office.

MR. HYNSON: Mr. Chairman, I remember last year that this Section offered a splendid opportunity for representatives from the Pharmaceutical Associations, especially State Associations, to extend their greetings and make suggestions as to the work of this Section. I don't know of anything that created more interest or did more good than that, because as the outgrowth of the suggestions by delegates from the State Association there was adopted a set of resolutions which placed this Section on record in regard to certain very important commercial topics; and I move, sir, if it is your pleasure, that delegates from the State Associations be requested to report the most important matters that occurred in the commercial part of pharmacy at their last state meeting.

THE CHAIRMAN: It has been moved and seconded that the delegates from the different State Associations be now given an opportunity to bring greetings and reports affecting this Section commercially.

Are you ready for the question? All in favor of this motion let it be known by saying aye; contrary no; the ayes have it; the motion prevails.

MR. HYNSON: I intended to include local pharmaceutical and drug associations and if there is no objection, I would include that in my motion.

THE CHAIRMAN: All right; include the local associations. Now, we will have a few minutes--three or five minutes' report from each one of the State Associations or Local Associations, or any reports that you may bring from your sections that may affect the commercial interests of pharmacy.

We will hear from Maryland first.

MR. HYNSON: I do not object to trying to start the ball rolling. I want to say as far as the Maryland Association is concerned, it is on record as being very desirous of con-

necting itself more closely with this Association. In 1902, in sending its greetings signed by my friend Schulze, who was then President, it suggested that the by-laws and constitution, if necessary, of this great American Pharmaceutical Association be so changed as to bring the state associations in closer touch. And I don't know if that had something to do with inspiring Mr. Gordon to write his paper the next year suggesting local branches; I would like to claim a little inspiration for the State of Maryland along that very important part of the Association's progress.

I want to say, as far as the state work here is concerned, I think it was hampered, as I think all work of that kind must be hampered from the fact that we should make the trip to Jamestown on the steamer and hold meetings on the boat, and then have a little jollification down there and hold meetings coming back. Now, that is very pleasant but in the experience of our Association, it interfered with the work of the Association and there was nothing much done. I think the most important thing that was done in the commercial line was the adoption of a code of ethics. Commercial topics were not formally considered, neither was anything else. I rather think the thing we should report is that we do not believe an excursion is a good way to transact the affairs of an association and I would have you all think very seriously about it before you adopt any such method. Indeed, I believe the work of any association is so important that it ought to be confined almost exclusively to work and then that pleasure should occur afterwards or at some other time.

THE CHAIRMAN: Who will speak on behalf of Pennsylvania? I notice in their reports generally they have considerable subject matter relating to the department of commercial pharmacy and that work, and I would like to hear from somebody representing Pennsylvania.

MR. LOWE: I suppose it is somewhat befitting that I should represent the Keystone State, as I have been acting this year as the President of that body, and I bring you the greeting of the Pennsylvania Pharmaceutical Association. We are in close affiliation with the A. Ph. A.; in fact, a large number of the Pennsylvania Association are also members of this Association. I never lose an opportunity of urging upon our members the necessity of uniting with the American Pharmaceutical Association. As I said to them at the meeting, if they join the American Pharmaceutical Association they are in the lead of the pharmacists of the United States. We are in very close touch and sympathy with you. We had a very excellent meeting this year at Bedford Springs. There was nothing to interfere with the meetings, which were very well attended. A large number of commercial problems were discussed. I think there were about thirty-three papers that were brought to the attention of the Association, which I believe is a larger number than have ever been brought in any other State. Pennsylvania has been noted for a number of years for doing pretty good work along this line. We had a very energetic chairman who has been elected Secretary of the Section on Education and Legislation, and very likely we will have the benefit of his services and opinions in that position. I am glad to be with you this morning to take part in your discussions, gentlemen.

MR. FREERICKS: I trust you will pardon me, but in coming from the State of Maryland to the State of Pennsylvania, we have passed by the State of Ohio, and I am proud to say I am here this morning, together with four others who have been appointed from our State Association, and we all have given time and effort to the affairs of the Commercial Section of the American Pharmaceutical Association, as it is, I believe, with the consent, and I might say, with the approval of our entire Association that we delegates who are present say that we trust that at this time the Commercial Section of the American Pharmaceutical Association will not allow to go undisputed the statement that during the past year there has been put forth a scheme on the part of the retail druggists of

this country in that they have been classified as a trust. We hope this body will not allow the opportunity to pass at this time to resolve that it believes the Sherman Act, as it is at present worded, to be unjust to the small dealers of the country, and that it should be amended; I believe in saying this, that I state to you the feeling of every druggist in the State of Ohio.

MR. HYNSON: I would like Mr. Diner to tell us what he is doing in his local association up in Harlem.

MR. DINER: That is very unfair. I had made an agreement with Mr. Hynson that only at a given signal I should take the floor and as he did not give me the signal he has violated his contract. I had many prepared speeches, not for this occasion at all; but as far as New York is concerned, to begin with the local branch of the American Pharmaceutical Association, I might say that by reason of a little hard work started by Mr. Mayo, we succeeded in organizing a little branch of the American Pharmaceutical Association which I believe has been doing some good work. It is rather young as yet and will do more good work later on, but we are claiming no honors on that score although we expect to become first and to claim the palm of all the local associations in the United States. This is natural New York modesty, by the way.

As far as the local associations are concerned in the commercial line, we have probably to thank the Retail Druggists Association for a series of propaganda work along the lines of the work of the U. S. P. and N. F., making it more popular among physicians. I believe it is a matter of record in history that we have been succeeding fairly well along those lines.

So far as our State Pharmaceutical Association is concerned, I am happy to say that our State meetings are always well attended and followed with the greatest interest by those who are there. A great deal of work is usually accomplished not only in scientific lines but along commercial lines, and the report of the Commercial Section this year was an elaborate, exhaustive and magnificent one to the interests of retail pharmacy. A number of papers were presented and particularly the papers on the Propaganda Work which you might class as a bridge between the Scientific and the Commercial, were listened to with great attention and called for quite some discussion, so much so that the members attending that Section have declared that they have never been to a more interesting session. We are loyal to the American Pharmaceutical Association, to the State and the city—that needs no re-affirmation and I believe further events will prove this even more so than the past.

THE CHAIRMAN: I believe it would be a matter of valuable information if our delegates, in reporting, could state something about the percentage of the pharmacists of their state that belong to the State Association and about the percentage of the actual membership that keep their dues paid up regularly. That is a matter that affects us continually in all our associations. We would like to have something along that line.

MR. PEASE: That is a matter that interests me quite a good deal, the percentage of members of our State Association who are members of the National Association. For thirteen or fourteen years I was a member of the Committee on Membership from Nebraska and it has been my pleasure to give a little talk at our State Association on joining this Association, and I have to fight against this impression, and it is regrettable too, that the members of our State Association imagine that the American Association is almost exclusively an association of colleges of pharmacy and trustees in those schools and that the commercial interests are not very much cared for. I think that is a great mistake, that this very Section ought to be made almost the most important one. What are these colleges of pharmacy training these young men for except for us to hire them

in our stores to help us in our business, and I regret that this Section is not made more important than it is. I am one of those druggists in a comparatively small town who hire young men all the while and I want my commercial interests looked after as far as possible.

As far as membership in this Association is concerned, in my State it numbers perhaps fifteen. We have 1,600 registered pharmacists in our State and this year added 4 or 5 and some may drop out; perhaps we have twenty now.

MR. CARTER: As to the Indiana Association, our membership in our State Association is about 500 out of about 2000 druggists in the state. The old officers of the State Association and members who attend the meetings all the time are about thirty in number, and at our meeting held at Evansville this year the commercial feature became quite a figure in the proceedings, especially the new Pure Food and Drug Law. We had an address by Mr. Bernard, the State Pure Food and Drug Commissioner, and he gave us to understand that the conditions were improved very much. We want to obey the law; that is the general understanding. We want time, of course, to get ready, and the commercial side of that question keeps growing bigger. If it had not been for the commercial feeling among the druggists, the same as among all other tradesmen—we call them tradesmen in this section—if they had to sell spirit of camphor at 40 cents as they did in some localities, it might not be the best spirit of camphor, and under the operations of the new law when they got 60 and 65 cents, the quality was up to the standard. They do not want to sell the inferior spirit of camphor and from now on do not propose to, and we feel that the new law is a good thing, we get better prices, and, while we don't acknowledge furnishing poor goods, there were commercial contingencies that had to be met in certain localities, so that the thing was very harmonious between, you might say, the State officials and druggists, and it was shown that the spirit of both parties was amicable, there was to be no persecution, but the laws must be honored and must be kept. Certainly, the general feeling towards the A. Ph. A. was the kindest feeling in the world and always has been, and the members that are present at this Section of the A. Ph. A. will be made more welcome and feel more fraternally to the retail druggists of the state.

THE CHAIRMAN: Is another delegate ready to report?

MR. LOWE: I would like to make an additional report to what I said a moment ago. I do not know as I should tell tales out of school, but the Pennsylvania Association consists of a thousand members; I have got the precise figures at my desk; I think possibly about 1100. The bills of the Treasurer go out a little before the first of June; but to the present day, between 600 and 700 have paid their dues for this year. I don't know whether you would consider that as a fair showing in other states or not; it is not as good as we would like to have.

Two or three years ago we got up quite a boom, and a good many members joined; some of these members are dropping out. We have got to go to work and hunt them up and galvanize them into a little life.

MR. CARTER: I rise to make a motion that a committee be appointed to draw up special resolutions on the Sherman Act as indicated by Mr. Freericks. (Seconded).

THE CHAIRMAN: It has been moved and seconded that a Committee on Resolutions be appointed with instructions to bring in a report on the subject matter contained in Mr. Freericks' remarks.

MR. HYNSON: I would like to suggest that this be a General Committee on Resolutions and that all matters be referred to it; and the committee could report at the afternoon session.

MR. CARTER: I accept the amendment.

THE CHAIRMAN: It has been moved and seconded that a committee of three be appointed. You have heard the motion. As many as are in favor of this motion will please let it be known by saying aye; contrary-minded no; the motion is carried.

As the Committee that has just been suggested, I am going to name Mr. Carter, of Indiana, Mr. Pease, of Nebraska, and Mr. Freericks, of Ohio.

Upon motion of Mr. Hynson, duly seconded, the regular order of business was proceeded with and Chairman Kniseley read his address, as follows:

Fellow Members: I come to you this morning with greetings, and congratulate the membership of this Association upon the arrival of this another meeting of our Section and for the successes of the year gone by.

We have not done half what we desired, nor can we hope ever to be able to do so. During the sessions of this Section I trust we will concentrate our thoughts and discussions upon those subjects most calculated to advance our financial interests. If during the past year we have accomplished anything by which our financial interests have been improved we should endeavor to impart this knowledge to our fellow associates in business; for to this end we organize and form associations of which this Section is a part of the grand A. Ph. A.

It is not my desire or intention to impose upon you a lengthy chairman's address. I regret very much that our Associations have been taught by force of custom to expect lengthy addresses from the chairman of a section any more than they would from a chairman of a committee.

I think all officers of a Section of this Association should endeavor to condense their reports and addresses and only present such subject matter as will prove beneficial to the membership, reviewing only those points of interest coming under our own observation. The membership of the Association should enter heartily into the discussion of all subjects presented, and each speaker bring out as many new points as possible, thus adding enthusiasm to our work and gaining much valuable knowledge.

In assuming the duties as Chairman of this Section last year I did so realizing the responsibility of the position and knew that to accomplish anything I must put my colleagues to work, for I enjoy the reputation at home of being able to get more work out of other people than almost anybody else could get out of them. I asked Mr. Wm. C. Powell to take charge of the New England States and select such persons as would respond to his request for contributions upon subjects that he considered proper to bring before this Association. Mr. Powell accepted this confidence and has done good work. I also assigned the states west of New England states to Mr. J. R. Francis, Indianapolis, to embrace all the territory west to Illinois, giving all the remainder of the territory to Miss Charlotte M. Stimpson and Mr. Chas. H. Avery, both of Chicago.

How well this committee has performed their work is to be seen by the well-selected program before you.

The past year has furnished us with some few conditions which may well be reviewed at this meeting. The markets have kept us well supplied, prices firm, with very little fluctuation; which condition alone denotes prosperity and gives manufacturers, jobbers and retailers alike fairer and more uniform prices. We note especially in many of the crude drugs, some chemicals and many of the heavy commercial drugs used in the arts and sciences advances in prices, thus indicating beneficial results from our National Pure Foods and Drugs Act, which we hope to see enforced to the extent that adulterated and misbranded drugs will be driven off the market, for it is not my observation that retail

druggists adulterate their drugs, but they do have a failing to some extent of selling them exactly as they come from the manufacturer and wholesaler whether they are adulterated or not.

We continue to protest against the discriminating fire insurance companies. They have no just cause for fixing rates 25 to 35 per cent. higher on drug stocks than many other classes of goods. We hope our American Druggists Fire Insurance Company will be instrumental in relieving us of this excessive rate.

The Parcels Post will be a fight to the finish. We should immediately find out where our congressman stands on the matter; if he is not with us, we should make it our business to see that he is lined up on our side of the question.

This infamous Parcels Post Bill, if it becomes a law, will do more to kill the legitimate trade of the retail merchants than any law ever enacted in our country.

Some of the large dailies are backed by corporations and will use their influence to secure the passage of this law. We must get ready for the fight and push a systematic campaign before another Congress convenes or the enemy will be in the lead.

The worst feature we will have to contend with is the fact that the mail-order houses are doing their best to spread discontent among the farmers and inhabitants of small towns and villages and enlisting these people's interest in the Parcels Post Bill. We should all be awakened to the danger surrounding us and work earnestly until we have defeated this attempt on the part of the mail order houses, to steal away a good part of our business.

DEFICIENT LAWS FOR COLLECTING OF ACCOUNTS.

This may not apply directly to drug stores of cities in the East, but it does materially effect the West. You all very well know a man can go to the court and claim current wages and he can collect them, but the law gives us very little opportunity to collect our prescriptions and drug account, for in nearly all instances it cost more to collect the bill than we realize after having made the collection. This should not be so.

Denatured alcohol, so far as my observation goes and applied to our Middle West especially, has been a failure with one exception, viz., the reduction of price on wood alcohol.

The Indianapolis Injunction Decree has been variously interpreted, but I believe there will be no material change of business. Manufactures are allowed and will act independently along the lines hereafter outlined by the N. A. R. D., and we may expect very little more cutting of prices than prevailed before the injunction proceedings. The educational campaign instituted by the N. A. R. D. will be felt for years to come, and have a material effect upon trade conditions throughout the entire country, reducing the desire to cut prices to the minimum, which will extend no further than department stores and mail order houses. If we can handle these we have solved the problem.

MR. CHAS. L. MEYER: I make a motion that the address be referred to the Committee on Resolutions. (Seconded.)

THE CHAIRMAN: You have heard the motion which has been seconded. Those in favor of the motion will say aye; those opposed no; the motion is carried and the address is referred.

The next order of business is the Secretary's report.

REPORT OF THE SECRETARY OF THE COMMERCIAL SECTION.

In laying out the work to be taken up in connection with the 1907 meeting, the first matter of importance consisted of a division of territory among the various members of the Committee, upon the suggestion of Mr. Wm. C. Powell. Having been passed upon

favorably by the Committee, Chairman H. D. Kniseley divided the country into three sections, and requests for papers for the commercial section were invited from various well known writers and specialists on many subjects regarded as being live issues before pharmacists of to-day.

The responses to these invitations were quite satisfactory.

The subject receiving the greater amount of thought in these papers has related most largely to the National Formulary and U. S. Phar. propaganda.

Next in importance to this topic the matter of drug store fire insurance has had the attention of the Committee and valuable papers were promised us bearing upon this very practical question.

In the selection of a special topic for discussion it was deemed most wise to depart from a purely commercial standpoint, and a combination of scientific as well as commercial interests was deemed best adapted to the present thought of this Section. It will be no doubt most profitable if this plan should be carried out in the future activities of this Section to the end that the work shall be most practical and profitable from the standpoint of financial as well as ethical advantage to all who are now interested in this department of the American Pharmaceutical Association.

CHAS. H. AVERY, *Sec'y.*

CHICAGO, ILL., *September 2, 1907.*

At the request of the Chairman Mr. H. P. Hynson then presented his paper "The Science of Commerce as Applied to Pharmacy," as follows :

THE SCIENCE OF COMMERCE.

BY HENRY P. HYNSON, BALTIMORE.

I am wondering, dear friends, if I may presume to claim your concentrated attention a few moments ; if I may beg you to push back, for the time, the diversified thoughts that are ever and forever crowding themselves upon us all and, with the light of reason brightly burning, patiently travel with me over paths that I have gone many, many times. Thus conditioned and so equipped, I would have you decide whether the beautiful vistas of truth I seem to have seen are indeed real or merely fanciful.

For your encouragement and for my apology, I wish to be allowed to read the following :

"But you are not the least indignant if when a man has stoutness of thought and swiftness of capacity, and, instead of being long-armed only, has the much greater gift of being long-headed you think it perfectly just that he should use his intellect to take the bread out of the mouths of all the other men in the town who are of the same trade with him; or use his breadth and sweep of sight to gather some branch of the commerce of the country into one great cobweb, of which he is, himself, to be the central spider, making every thread vibrate with the points of his claws, and commanding every avenue with the facets of his eyes."

This extract is probably familiar to you all ; if there happens to be any one, among you, who does not recognize it, he will, no doubt, decide that it was lately uttered and has direct bearing upon present conditions. On the contrary, these words were written more than sixty years ago and conclusively prove that the commercial evils of to-day are certainly not new in

kind : that commercial practices are really no worse than formerly and, maybe, not so bad. This must be your encouragement to continue and enlarge true commercial education. My excuse is found in the fact that the quotation is from the writings of such a distinguished scholar and such a profound and effective moral philosopher as John Ruskin, the same John Ruskin who wrote : "I believe one of the worst symptoms of modern society to be, its notion of great inferiority as necessarily belonging to the character of a tradesman." If he could earnestly discuss what he is pleased to style the "Broad Principles of Commerce," certainly, you and I may not suffer by a like engagement.

With all this in view, it is indeed strange that the caption of this article, "The Science of Commerce," should be a combination of words which has sadly nauseated a learned doctor of philosophy, if his own blunt expressions are to be relied upon. The sensitiveness of his mental stomach, owing to the restricted diet natural to his class, has very likely extended to his nervous system and he has, no, doubt, been thrown into violent fits while visiting England, because of the awful profanation there of the title that is hereabouts used to indicate his most honorable specialty in science.

But this unfortunate sensitiveness in no way disapproves the fact that commerce and trade mean about the same thing, nor does it deny that there are fixed laws of trade based, as they are, upon fundamental truths, the establishment of which makes them, and whatever knowledge that has been accurately formulated regarding them, undoubtedly scientific.

If our easily nauseated friend will allow us to make use of the term "science of pharmacy," which was used so long ago as 1840 by another most distinguished scholar and writer, the great Macaulay, who then classed pharmacy with geology and navigation as "progressive sciences," we may venture to say the science of commerce is much like the science of pharmacy, a combination of several more restricted sciences, ordered and arranged for practical and helpful purposes. The broader sciences, such as ethics, economics, mathematics and jurisprudence, together with those of a more specialized nature, make up this second combination with which we are just now concerned.

However remote such a possibility may be, there is need to make warning against confusing this discussion with the one that is both old and new and which is always provoked by the question : "Is pharmacy a trade or profession?" Such a question suggests an entirely different theme ; one far less important, however interesting it may be, and certainly comprehended in one or the other of two propositions. Either it is he who uses his mind alone in the accomplishment of his purposes that is a professional man, or it is he who uses both mind and matter, primarily, without regard to personal loss or reward, for the betterment of fellow-men. In the one case, there would be but few professional men, no more, perhaps, than the

theologians, lawyers and teachers ; in the other case, there would be many, including honest milkmen, conscientious butchers and, it is hoped, some pharmacists.

So it must appear we are, in this instance, dealing with something of much more moment ; offering thought upon a subject which really concerns the welfare and happiness of all who use and need dollars. It is, therefore, not worth the time and effort necessary to test the science of commerce by the standards of any particular person or set of persons ; it is quite sufficient for us to know, and to own that we know, that there are enough immutable laws of trade ; controlling trade principles ; trade ethics ; trade rules ; trade practices and trade technique to make up such a sum total of truths as will warrant the conscientious consideration of all intelligent tradesmen and offer subjects for discussion that are directly pertinent to the aims and objects of this Section.

If, indeed, a science of commerce did not exist, we would be in duty bound to create such a science, since we must, like all other men, trade our wares, be our wares thought or brawn or muscle, the product of these or any of these. If we are proud of following exact truth in our pharmaceutical practice, why should we not be proud of following the same in our commercial doings? If in the one we must conform to the requirements of its science, why should not the other follow the demands of its particular truths? If for any cause the practices are not evenly balanced, then we have the picture of the one-sided man, a thing neither successful nor beautiful ; an unequal team, the one member retarding the other, the one disparaging the attractiveness of the other, no matter how exalted the one may be.

"Jacob have I loved, but Esau have I hated." Why? The man of the field is equally useful ; he must regain his birthright ; he must be educated, not, perhaps, in the *same* quality as is Jacob educated, but of *equal* quality and to as great an extent, for Esau must at least talk well and write well to his people, even as Jacob must unto his. The commercial man most needs to be accomplished, for his is the greater contest, and let it be well understood that he needs even a little more of educational finish than does Jacob, the so-styled more orthodox scientist. Since this Association has been well styled a post-graduate school, we may in it be helpful to each other regarding our educational shortcomings, especially such as are found to exist in commercial training.

No science of commerce, no truths, no exact knowledge for the daily duty of the multitude ; for commercial pharmacists? No science of morals for tradesmen ; no trade ethics? Where are they needed more? Who should know them better? The brilliant but erratic Ingalls has said, "The decalogue and the golden rule have no place in politics," but who will be bold enough to say that these are not the guiding stars of trade. Pity the tradesman who knows least about them and who follows them not.

Even the men who will deny the science of God—*theology*—must respect science of men's morals—*ethics*—a special science, dear friends, whose votaries, with great credit to themselves, are diligently trying to make plain to all mankind, the rules of conduct of man toward man, rules based upon the fundamental principle that men are brothers; such it would seem, is the next very highest science, and the most beautiful, save one. When we know that much if not most of sin follows ignorance of sin, it is almost impossible to believe that there is any one who does not desire all the knowledge he can possibly obtain upon this sublime subject, man's relation to man—*ethics*—especially regarding its application to the very complex dealing of the pharmacist. It is only necessary to go about our fellows, or turn the page of our journals to ascertain how little we know about ethics. Many there are of us who think that a pharmacist is ethical or not, in proportion to his efforts to promote the prescribing of U. S. P. or N. F. preparations, and if his position in this regard is secure, he is entirely ethical, which, of course, is absurd. He should know that he is unethical, if he, personally, be unfit, by reason of character, education or practice; that he is morally unscientific if he does not know the proper relationship to maintain with those from whom he makes purchases, as well as those to whom he furnishes supplies. It is in ethics that we have the science of and may study our relationship with the government, national and state, physicians, fellow-pharmacists, transportation companies, banks; with every one with whom we have dealings, and this specialized science is a part of the science of commerce.

Esthetics. We must indeed know as much of the science of beauty as we can acquire; the science that holds the real and fundamental truths regulating our taste, our manners and our appreciation of these. A tradesman may be strictly honest and altogether loyal, straightforward, reliable, energetic and yet, withal, entirely unfit in person, manner and address, for trading; may be a positively impossible business associate. He may, it is true, find at last his level, but will never find rest; for trade, a part of society, has no fixed stratum. Not rising, he must descend, and in doing so, lowers the level of the mass of which he is a part. Esthetical knowledge of the better kind, like Ruskin's types of beauty and lamps of architecture, thoroughly understood, will lend more help to the betterment of trade conditions and to the enjoyment of trade practice than all the superficial "plans" and the impossible "contracts" that have ever failed or are still to be tried. Such science teaches the fitness of things, leads to consistent conduct, and enables us to comprehend the better tastes of the more exacting patron. Such sound esthetical knowledge would, at once, prevent the butcher-pharmacist from delivering his fine (?) pharmaceutical products from the same wagon and by the same begrimed, foul-smelling wagoner that shoulders the "fore" quarters or the "hind." Naturally, to such a wagoner, all shops look alike, as do madam and maid, silk and

serge ; the dispensing counter and the meat block are all the same to him. The soda water dispenser may or may not display excellent taste in the selection of his fountain and the arrangement of the accessories, but what if he has, if he constantly, or even occasionally, decorates the ends of his soda water counter, or fills a nearby window with a pyramid of the most disgustingly suggestive merchandise? It is, indeed, quite popular to pile these same packages of fiber up against the wall at the end of the soda fountain counter and use this display as an inviting background for the handsome crushed fruit bowl. Not the science of beauty, a part of the science of commerce is it, my hearers, that teaches this, or leads the perfumer-pharmacist to obscure the ends of his sachet case with cards of appliances for the use of men only, or ornament the top of the toilet soap case with the kind of vessels that, even in the sick-room, are carried under a towel. Who does such things? Now why do you ask ; have you never transgressed, and must I blush because of what I remember? It may be we know better, but become careless, or forget ; perhaps so, just as some forget to use the scientific training they have had in other directions.

The science of speech and the science of letters are most attractive component parts of the "science of commerce" and who can possibly estimate the combined power of these for gain ; the commercial value of fine speech and elegant composition? And who so badly needs, at times, this fine speech or who, once in a while, stands in such positive want of this elegant composition as you or I?

The science of mathematics really known and understood is a commercial assistant scarcely to be valued in its own figures. Quick, accurate ways, short cuts in computations, not necessarily by written rule, but always in accord with the fixed principles of the science, are the helps that we could give each other and are the needs of us all. Because we know these principles so well, we do not credit as eminently scientific such well-known facts as "40 off" leaves "60 on," or that twenty-five times a number is one fourth as much as one hundred times the same number ; that ten times a number and half that sum added is fifteen times the original, and yet, these "small things," which some know and many do not, make up this science of commerce.

Then there is that other part, the science of accounts. Book-keeping, which is as logical as is algebra and as true as is geometry. The science of accounts is built upon the purest ethics and is controlled by the fairest rules of art. To practice it by rote, without understanding its governing principles, renders one as helpless as is the empirical chemist. To the forms of book-keeping may be applied with both satisfaction and profit, all the principles that combine to make esthetic law, and the rewards to its conscientious votaries are most substantial. Closely associated with it is true knowledge of banking, transportation, insurance and credits, all of which is easily demonstrable, scientific, and of a kind that make the possessor confident, proud, happy and truly successful.

I plead then for Esau, for Esau, that his birthright may be restored to him; that all the blessings may not fall upon Jacob, and since the science of pharmacy and the science of commerce are indeed twins, that they may live and labor together in harmony, each lending to the other's success and to the other's glory.

THE CHAIRMAN: I must take this occasion to thank Mr. Hynson for this valuable paper. It is submitted to you now for your consideration. What will you do with it? I shall be glad to have any discussion upon this paper.

MR. MAIN: I move that the paper be received and referred to the Publication Committee. (Seconded.)

THE CHAIRMAN: What is your pleasure? All in favor of the motion that the paper be received and referred to the Publication Committee signify by saying aye; contrary-minded no; the motion is carried and the paper is referred to the Publication Committee.

The second paper we will read by title only: "How to Make a Drug-Store Attractive and Advertise Side Lines," by William Mittelbach, of Boonville, Mo., unless he has authorized somebody to present this paper for him.

HOW TO MAKE A DRUG STORE ATTRACTIVE AND ADVERTISE SIDE LINES.

BY WILLIAM MITTELBACH, BOONVILLE, MO.

The front of the store should be well painted with attractive colors. Show-windows must be well arranged and filled with seasonable goods clearly priced. Glass in windows and their contents must be free from dust and other dirt. Stock bottles must be shining and free from the drippings, and arranged with military precision. Patent medicines, if exposed, should frequently be dusted and arranged in classes for convenience. Show-cases must always be free of finger-prints, and be polished. They must be filled (not crowded) with the best grade of sundries and other side lines. Never put the cheap goods in the cases and the better grades under the counter. Everybody prefers the best quality of goods, although not always able to buy them. The display easels, racks and other containers and holders resting on the show-cases must be clean and fresh-looking, and should be shifted about some. The floor must be well swept at all times. It is not absolutely necessary to have tiling or other expensive stuff on the floor. A clean, well-swept, pine floor is indicative of a clean place. Above all have the prescription department and laboratory in perfect order. Cleanliness there will bring more favorable comments than elaborate and costly fixtures. This department is the pharmacist's kitchen, and should necessarily be well arranged. Every good woman will tell you that the kitchen should be the cleanest and most orderly room in the house. An orderly arrangement of your side lines in clean, roomy

show-cases is the best advertisement you can give the store. It beats all newspaper advertisements. A clean, well-arranged drug store is *always* attractive. *Cleanliness and order* are the two things to carry out at all times.

The next paper is "A Preachment on the Inventory," by Harry B. Mason, of Detroit.

Mr. Mason read his paper.

A PREACHMENT ON THE INVENTORY.

BY HARRY B. MASON.

The Secretary of this Section, in asking that I present a paper on inventory-taking for the present meeting, remarked that in his recent travels among druggists he had been astonished to find how few of them ever took stock. With equal astonishment I have made the same discovery myself from correspondence conducted with druggists all over the country during the last two or three years.

Now, gentlemen, I am neither a prophet nor the son of a prophet, but I want to say with as much conviction as in me lies that the day has come when the American pharmacist must do business in accordance with twentieth century methods. He will rue it if he doesn't—that's all!

Trade is today conducted on a scientific basis. Every detail is watched with constant scrutiny. Waste is eliminated. By-products are utilized. Expenses are reduced. Has the druggist realized these things? Has he adapted himself to the changes which are taking place around him? For the most part he has not, and we need go no further to discover why he has in so many instances been all but crushed by such rivals as the large retailers in his own line, the department stores, the United Cigar Stores Company, and other competitors that might be mentioned.

It is simply the familiar lesson of evolutionary science. Changes are slowly taking place in the drug business as they are taking place in every other department of commercial and industrial life. The druggist who adapts himself to his transforming environment will "survive." The druggist who fails to make the adaptation will fail. This same struggle for survival has been fought out among plants, among animals, among men, and among the institutions of men, ever since the earth was first blessed with life; and it will continue to be fought out to the end of time. The "fit" remain. The "unfit" perish.

Not long since a friend of mine and myself were unfortunate enough to capsize in a sail-boat. Simply because the cock-pit had been a very safe and comfortable place before, did we continue to sit there and let the water roll over us? Not much. We hustled over the rail, climbed out on the upturned bottom of the boat, and perched there as chipper as you please.

All this means that the druggist must change with the times if he desires to hold his own. He must abandon the loose business methods which have satisfied him in the past. He must learn to avail himself of his cash discounts. He must watch his book accounts with creditors. He must make prompt collections. He must prevent the accumulation of dead stock. He must buy wisely, sell aggressively, and advertise skillfully. He must know his percentage of expense; he must understand his percentage of profit; and he must realize whether a given transaction yields him returns or causes him an actual loss.

The inventory, which I am particularly invited to discuss in this paper, forms the very basis of the structure. It is the first thing to which that druggist should give his attention who desires to do business in a business-like way, and who has reached the point where he wants to *know* and not to *guess*.

Without some system of business accounting, it is impossible to know what one's expenses are and whether a given sale really yields a profit or not. And without inventory figures back of such a system, it is well-nigh worthless. There are thousands of druggists who delude themselves into the lazy and comforting deception that their stock remains the same and that the money which they have spent for living during the year, plus that on hand at the year's completion, represents the net profit which their business has yielded them. This is a careless, unscientific, inaccurate practice which no wise business man should countenance for an instant.

A druggist in Canada who had never taken stock, and who fancied that he knew the condition of his business without it, found when he came to sell, and when an inventory was insisted upon by the purchaser, that the stock and fixtures were not worth within \$1500 of what he had imagined. This slump had taken place in a little more than three years. Each year, then, he had been deceived in his figures to the extent of \$500. If this amount had been deducted from his annual profits, as it should have been, he would have known what his actual income was and could have lived accordingly. As it was, he probably spent \$500 of his permanent principal every year without suspecting it for an instant. Then, too, had he been in possession of the real facts he would have realized what his percentage of profit was and could have awakened himself to the necessity of improving the situation either by increasing the rate of profit or decreasing the rate of expense.

Now this was just an average case. It was not at all unusual, and I have no doubt that it could be duplicated hundreds and even thousands of times. In my correspondence with druggists I have been brought in contact with numerous cases where the inventory figures have disclosed annual differences in the value of the stock to the extent of anywhere from \$200 to \$2000, according to the size of the store and the nature of the circumstances. The stock in any store is constantly shifting; the prices are forever fluctuating; the fixtures, and particularly the soda fountain and its

appurtenances, are always undergoing depreciation, and the druggist who is not aware of the exact nature and extent of these changes is not in position to know where he stands. He may fancy his percentage of gross profit to be 40 when in fact it is only 30, and he may consequently be losing money on many transactions which he fondly believes are yielding him good returns. He may be eating up his capital slowly in utter ignorance of it—and ignorance is not always bliss when the awakening comes!

I read a paper on a subject allied to this at a meeting in Philadelphia not many months ago, and a well-known pharmacist in that city of pharmaceutical ideals, in discussing the paper afterwards, took me severely to task for insisting upon annual inventories as the basis of any system of business records and profit calculations.

"It's too much trouble and it's entirely unnecessary," he declared. "You can know the conditions near enough without it. I did think last year I would take stock, but I never struck such a job in my life. It was endless. I began in the summer and I haven't finished yet. I don't think I *ever will* finish, and I shall certainly never attempt the task again."

The worst of it is, the audience laughed sympathetically as though the experience were a common one.

But this druggist's position is absolutely untenable. An inventory isn't such a tedious and endless job if the druggist goes at it in the right way. He should select a season when trade is dull and sales are few. He should put himself and all his clerks at the task. He should keep at it steadily and systematically until it is done, working nights up to one or two o'clock in the morning, letting everything go that can be escaped, and perhaps selecting some Sunday for a part of the work when the store can be closed arbitrarily even if it is not the custom. Attacked with this spirit and in this manner, the inventory can be completed in 2 or 3 days at the most, and probably in a still shorter time.

It isn't necessary to weigh every last article in the store. The hundred and one fluidextracts, for instance, need not be separately measured, entered and priced. Every practical requirement will be met if a mental calculation is made of the total volume of fluidextracts, and if an average price is assumed of, say, \$1.25 per pound. The same method may be followed with sufficient accuracy in the case of tinctures, pills, tablets, and similar groups of articles. Average costs can easily be determined by a little calculation.

Costs and values should not be recorded, however, when the inventory is being taken. To do so would delay the operation unnecessarily—and perhaps we have here one reason why our Philadelphia friend got stuck in the middle of his task. The figures can be entered at leisure afterwards. Of what use anyway would an inventory be that was prolonged through a considerable period of time, as happened in the case of the Philadelphian? How much accuracy would it possess with sales and purchases going on continuously.

As for the book to be employed, either a ruled blankbook filled in with the record of your own stock, or a druggist's inventory book already printed for the purpose, would do, but the former, after being once prepared, would fit individual requirements more satisfactorily. Columns could be left for future years, so that the names of the goods themselves need be written on the first occasion only, save in those relatively few cases where new articles were put into stock. Two men should work together, one calling off the articles and quantities, and the other, book in hand, writing them down.

Merchandise and fixtures should of course be separately itemized and recorded. The former may be taken at its market value if not shopworn or otherwise deteriorated. With the latter a percentage should invariably be written off for depreciation—ten per cent. for the soda fountain and five per cent. for the show-cases and shelving are the usual figures. As for book accounts, no definite rule can be laid down. Some are bad and are really worth little if anything at all, while others are worth perhaps 50 or 75 per cent. of their face value.

But in writing this paper I have not sought so much to go into the thousand and one details of stock-taking as to point out the important part played by the inventory in modern business. I have been anxious to show that it is the very heart and core of any system of business accounting, that without it the druggist could not know with sufficient accuracy where he stood, that he could not understand what his profits actually were, that he could not always know whether he was really making money or losing it, and that in any event he was not in position to conduct his business in the scientific manner demanded by the fierce competition of the time.

Have I succeeded in my task? I certainly hope so.

MR. PEASE: I would like to supplement some things that Mr. Mason has said founded on my own experience, how I conduct the work of taking an inventory in my store. I believe, with him, that it should be taken every year. I do not have a soda fountain in my store, and I take my inventory in the month of July, which is a comparatively dull time with me, and I find this: A great many of the articles I buy come in original packages, so it is very easy to pick up a bottle and say "Four-fifths of a pound at 80c.," in the same way with chemicals. I say one pound of chemicals, and make the mental calculation; it is not necessary to write out the name. Then again, there is a certain section of shelving in the normal drug store that always represents about the same value per shelf. That is what I call the tincture shelf. There will be five or six shelves perhaps that won't fluctuate \$2 in ten years. I find from experience that the tincture shelf represents about \$90. Anyway, I don't measure every tincture or weigh every powder. But I say "Medicines in Tincture Shelving, \$90," and I save perhaps a whole day's work in doing that particular part of the inventory.

Then, I absolutely mark the cost price on every item that comes in my store, except patent medicines, so as to keep track of everything; you are never in doubt about the cost. When you take an inventory, take the cost, to which you afterwards make an addition for freight, for this risk of depreciation in one place is almost invariably offset by

appreciation in another place. There is some variation in the price of alcohol or chloroform but the bulk of the rest of your stock, sundries make up your stock, and the proportion is comparatively small, and in these days of 2, 4 and 8 for most patent preparations, some things are higher and some lower. If some things are different in value, specify that, but in the bulk of cases take all patent medicines at the retail price and subtract one-third. When you extend you have saved a good deal of looking up these prices; you have saved a lot of time in summing up and making your extensions.

To show you how accurately my system works out, I have tried it at various times and in various ways. One year in taking an inventory of a stock of \$12,000 of merchandise alone, my stock estimate varied only \$40, and never has it varied more than \$200 in a stock of that size. This year my stock alone inventoried about \$15,000 and my inventory varied about \$200. I make a stock estimate every week. In this way I know exactly what my sales are. If there are \$300 worth of goods that I have sold out that cost me \$195, I subtract \$195 from my stock estimate and I add to that the purchases during the week, so every week I know exactly Saturday night or Monday morning, what my stock is, and if I burn out I can settle with the insurance company in fifteen minutes, and I have had two fires in my place and have had no difficulty in settling.

I take my book accounts; I have my bookkeeper figure up the book accounts and simply subtract 20 per cent. If my book accounts are \$2,000, I take off the 20 per cent. and feel perfectly safe; I find by years of experience that perhaps it is absolutely safe.

I have a separate book for my tinctures. My tinctures don't change much from year to year, and having this separate book, I take a hundred-page journal and I mark all my entries on the left-hand page and use every other line. The entire right hand page is ruled in multiple columns so that each year when I renew my inventory of my tinctures, I simply extend the amount; it is a very simple thing. It does not require listing again. If there are some portions of tinctures that have disappeared or are broken sales for that same year, you omit that item in extending in the new column. If you have added something, you put it in the new line. That saves re-listing. I have tried to use a book but have never found it practical to use a book written in year after year. I find that it requires a new book every year, because certain stock will change in position. Suppose you take the stock-book and go down the page, you will find something that was not on the page last year. It is in a new place each year, so the thing is to take the items just as you come to them in the store.

THE CHAIRMAN: Is there any further discussion of this paper?

MR. HYNSON: If you have a set of fixtures worth \$2,000 this year and charge off 5 per cent., and the next year you conclude to buy a new show case worth \$200, you have added \$200 to your fixtures; you deduct \$100 or \$105 or \$110 from \$2200, and you still are away above; I have had that experience in a number of instances.

A MEMBER: There are a great many things that count in a drug store; it is pretty hard to state what they should be; I suppose that your theory is to leave it all to the judgment of the man himself as to what it is worth. Of course there are items of value. The taking of the inventory in an average retail drug store is a matter of difficulty at the best. We have tried in our store working at night, working on Sundays, and it has been about the toughest proposition I have ever taken hold of in the retail drug tradé. We had an experience where an inventory was worked out at one of my stores for about two months, they finally dropped it and I believe it was never completed until I completed it roughly myself; my employees gave it up in disgust, and they worked at it so long that it was practically valueless.

There is another instance in regard to the change of values. I put a figure in a certain inventory and at the end of the year we took a very thorough invoice of that store and we

found the variation was about \$350 on about \$18,000 of stock and fixtures. At the end of the next year I made an estimate probably sixty days before taking the second inventory, and when I took the invoice as completely as I could get it, the variation was about \$200 and we had had a month of the hardest work I believe I ever had in my life. That is my experience in the inventory proposition. Of course that does not prove invoicing not to be a good thing, but I confess I have never seen my way clear to take the inventory every year, although we keep in as close touch as we possibly can. I must confess I cannot see my way clear to make an easy job out of it. Of course the business is hard work, but as a rule it is pleasant work. I believe every retail druggists' experience is the same. He is not like a grocer or dry-goods man that shuts up at five o'clock or six o'clock and on Sundays, and there is really no force about the store that he can take from their regular work to make an inventory. I am confident in almost every store the actual business of the store will suffer in taking the inventory. The question is, do the results compensate for the loss of other business during the taking of the inventory, that is always the case.

MR. DINER: I am far from agreeing with the previous speaker. I realize that an inventory in a drug store is an absolutely essential matter, not only an annual inventory but in a great many things handled by the druggist directly, monthly stock taken should be had; for instance in the perfumery line and cigar line and all the other lines. It can be done very readily. A man that bunches all his losses and receipts never knows whether a side line really pays him or not; he only guesses at it. When I first started in business I opened an account for every one of my side lines—cigars, perfumes, candy, soda water and everything else had a sheet and a list all by themselves. Now, any purchase made during the month in any of those side lines is charged to that particular account. The receipts are arrived at every day and separated by the aid of a cash register having buttons for that particular line, or it can be done by cash slips; at the end of the month I total the receipts for cigars and total the receipts for perfumes, etc., in any one of those side lines and credit that particular account with the amount received. In addition to that, I would take stock, which can be done in a very few moments in all the side lines, charging out the amount of goods on hand in any particular line. You have the amount received for sales in that particular line, and of course it should be higher than the amount expended for that particular amount, unless the stock has increased materially. Here's where my inventory does me good. If I find a particular line has used up \$500 worth of goods, that my receipts from that line are \$400, and that I have got \$150 of stock left, it shows a profit of \$50. Now, on a \$500 purchase I find I am not getting the necessary advantage from that particular line. So I either devote a little more energy or advertising to that line to try to find out whether it was my fault that the line is not yielding a better profit, or after finding it is not working well, I come to the conclusion that that particular side line is not a profitable side line for my neighborhood, and I drop it. I find I have saved myself a good deal of loss and that a side line which I entered with a good deal of hesitation, feeling almost sure beforehand it would not be a go, proved to be a good money-maker for me.

MR. APPLE: I have had some experience a little different from that of the previous speaker. When I got my cash register into practical working order, I took care to keep the different departments separate, such as sundries, soda water, prescriptions, etc. But, when a person came in and made some five or six purchases out of different departments, I found that when I came to register it on the register it was impracticable to separate them, the purchaser could not get the amount of a full purchase and I needed not so much a cash register as I did a piano player. Mr. Diner's plan of using a register might bring to the mind of those present the idea of keeping a register of that character, so I thought I would get up and give my experience in a practical way to show that you

must not depend too much on a cash register of that character. One of the best systems that appeals to me is the use of a small register with one or two departments.

MR. PEASE: I want to supplement what I said in regard to taking an inventory and knowing how much your sales were. Suppose that during the week you were taking an inventory, your sales were \$500; any man who knows his business knows what his gross percentage of profits is. Suppose his gross percentage of profit is 35 per cent., then he knows he sold \$500 worth of goods which cost him \$325. Now, say you have reduced your stock, how much do you suppose you will have of actual value of stock in the end? Suppose you began with \$10,000 worth of goods this year; suppose you bought \$10,000 worth during the year. If you had sold nothing you would have \$20,000 worth of goods on hand. Suppose you take an inventory next year and have \$12,000 worth of goods left; you find you have sold goods that cost you \$8,000 for say \$12,500; it is a very easy matter to figure the gross profits.

MR. BENFIELD: One item that was spoken of was measuring the stock, then taking the price and entering it in that manner. It strikes me that the gentleman who made that remark said he had already had two fire losses. Unfortunately, I have gone him one better, I have had three, and in the case of two of them it included the loss of stock, and in the third only the loss of fixtures. The insurance companies scrutinize your inventories pretty thoroughly. They want to know what you have lost and when you took your inventory and how much it was when you took it, and then they make their own deductions and additions for sales and purchases, as they see fit. You may say what you choose, but they have their own opinion and you have got to substantiate your claim by figures and not by simply saying what you think your losses have been. In one instance there was not any question about it, because I was fortunate enough to have a very heavy loss and very little insurance. In the other case the loss was simply the time taken in vacating the store and getting back into it, because we were reimbursed for our actual loss; we were fortunate enough to be pretty well covered with insurance.

Mr. Hynson said there were no short-cuts in the matter of estimating values. We have shown that in inventories we have taken in the past and the one that was taken this year. I tried to prove on the item of pressed herbs, to see how near we came to the figures of our estimate. We placed the estimate at 20 cents a pound and we had about 100 pounds of the herbs; I think 92 pounds of pressed herbs in stock, and the estimate was made at 20 cents a pound; in a leisure moment, I think at home one evening I took the catalogue and the inventory and figured it out; the actual figures proved to be 19¾ cents; I thought I had hit it pretty close.

I tried it again on another item, tablet triturates, and I did not hit it so close; but I think it is a fair way and it short-cuts a good many items. We have done that; it is frequently deceptive.

As to the manner of taking an inventory, we adopted a plan which is in use by one of the very largest stores in our city, and that is using a book containing forty pages, a small book which can be attached to the entry book and not be cumbersome. You can carry that around with you and make entries while someone else calls the items off.

We tried another little plan which was quite satisfactory, and that was of going through the stock before the caller and entry clerk made their rounds and putting tickets with the goods, so that the clerk making sales from them could change the ticket at the time of sale and thus keep his inventory slip correct, and that it could be entered quite readily and rapidly.

MR. HYNSON: I want to strongly endorse Mr. Mason's efforts to try to induce Pharmacists to take an inventory. There is one thing brought out here that I would inveigh against as strongly as I possibly can, and that is the bunching idea; one should not be

at all careless about these things; the tendency is to grow more and more careless until finally you lump the whole thing.

In taking an inventory you want to forget that you ever took one before and be as accurate as you possibly can be. In the case of solids, if it is done by a person who can accurately estimate the weights of substances and knows their relative specific gravity, it might be done by measuring with the eye, but I really think this is almost dangerous. On the other hand, liquids can be accurately measured by having a stick graduated for each size bottle, but do not think you can guess at the value of your stock. I see Mr. Main, who is engaged in the wholesale trade nodding consent. I feel that this is a very important matter.

One other point that I want to bring out is that this inventory has another great value which Mr. Diner spoke of, it makes you know your stock; it gives you an excellent chance to take advantage of your exchange privileges. Certainly once a year is a good time to pull out of your stock the things that have not been selling; reduce your stock, get rid of it.

The three points are—know the value of your stock, get acquainted with your stock and take advantage of your exchange privilege. There are a great many others.

MR. WILLIAMS: I want to agree with Mr. Hynson; I think his position is absolutely correct and I am willing to do honest work in taking off an inventory. We do away with weighing as much as we can. For instance, in a certain section of shelving we will take an empty bottle and set it on one side of the balance and set a bottle containing a certain portion of the drug on the other, and in taking stock of tablet triturates and pills we will count 100 and weigh the remaining quantity and estimate it on the weight of 100, and you can take the stock of practically everything in the way of liquids and tablet triturates by that method and get it accurately.

MR. CARTER: I want to say that I think Mr. Hynson is absolutely right in regard to guessing; if you are going to guess, you might as well sit down and estimate you have so much stock in the store. I would estimate on the whole stock as well as estimate on a few items. There is one suggestion I would like to make in regard to the depreciation of fixtures, which is the custom recommended by the Chartered Accountants of New York—we have chartered accountants who are now coming more and more into use for the purpose of determining with accuracy the profits of any concern during the year. These chartered accountants have a book, in the first place, or a place in the books for all fixtures. Those are put down at the figure they at first estimated at, the cost is arrived at and it is kept intact on those books. They are kept in good order by repairs from time to time, these repairs being charged to the general expense account for the year. A depreciation account, however, is opened and every year your fixtures in a certain line show your shelving, etc., for instance, is estimated at \$1,000 but in this depreciation account there is \$100, maybe, written off or credited to that account, and in making up the balance for the year, of course the depreciation account is deducted from the gross profits. The advantage of that is that you know exactly what your fixtures cost, in the first place, and in the event of fire, if you have kept those fixtures in repair and charged your expense for keeping them in repair to your expense account, they should be worth as much as they were in the first place; but you have got an account in case of fire loss, which is absolute and accurate. I think you will find the depreciation account will be better than changing your inventory from time to time. If you started in with \$1,000, we will say, in the first instance, for your shelving and you deduct, say 5 per cent. at the end of the year, and another 5 per cent. from that at the end of the next year, you would soon lose track of the original cost; in this manner you have always got the original cost.

A gentleman stated his practice of having the items weighed and a slip put in, and sales of that particular thing, before the inventory was taken, deducted from that slip; I want to say that it is the custom in nearly all the wholesale establishments where they are preparing for a week or ten days before that and getting things in order, because it is absolutely necessary for them to take stock in twenty-four hours. The items to be weighed are taken beforehand, barrels, bales, and so on, and a ticket put on them with the weight of that article, and if in the meantime before the inventory is taken, they have occasion to take from that package, the ticket will show the amount, so many pounds deducted; and you will find that is a very good way to prepare for your annual stock taking, and if you make these preparations you will find stock taking is not nearly so bad as it looks.

MR. GALLAGHER: I have always looked at it this way in taking an inventory; a man has two purposes in view, one is to find out whether he is making money or losing money, and the other, in case there is a fire, to have something that he could submit to the insurance company as a basis of settlement. I would like to ask whether in insurance companies an inventory which simply said that in such a section there were so many dollars worth of goods, would be satisfactory as an inventory? Probably Mr. Freericks can answer that question.

MR. FREERICKS: My experience has been that it would not.

MR. GALLAGHER: That is my idea. A good many years ago we decide^d that we wanted an inventory of stock. Naturally, neither the clerk nor I had any experience in taking an inventory, and we looked upon it as an enormous job. Like our friend who spoke a few minutes ago, we started weighing, and at the end of the day we wrote the stock in the book, closing the book at night and working until three o'clock in the morning. We naturally had a sore head, but realizing how little work there was to it, we have continued it year after year, and when I owned two stores we used to take the inventory of one store in January, and the inventory of the other store in July, and we never found it was a very difficult or hard matter. The most work I always found was in figuring up the work at the end, and yet I found I could take a night or some other part of the day when there was not much doing; but I have continued that practice for at least ten years, and while some of the suggestions made here in regard to making inventories are excellent, I think it is a very serious mistake to bulk items, and then in case of fire loss not be able to say that this is an inventory taken on such and such a date.

MR. HYNSON: I must apologize for taking so much time, but I come from a town that had a fire experience, if you remember, and this matter of inventory was very strongly insisted upon. I want to tell you in making your inventory you should make it specific; you have got to have the date and you have got to have the location of the goods—don't forget to put down that these goods were in the south front window or the left-hand front window; in the third story; in the cellar or sub-cellar; make a definite inventory of each portion of your store. Don't forget that, because in case of fire loss, it is likely to make a great difference; it is a very important matter.

Another important thing is this; unless you have a fireproof safe, an absolutely fireproof safe, be sure you take a copy of your inventory home with you.

MR. LILLIE: For information I want to ask whether it is necessary to have each item mentioned on the inventory. For instance, there are a large number of twenty-five cent items, fifty cent items and dollar items. I have been accustomed to making columns, and under the columns marked twenty-five cents, I would put the number of bottles of each kind, the number of packages or bottles of each twenty-five cent item, and at the bottom

I would foot them up, and there would be, say, two hundred twenty-five cent packages, all averaging at about the same price. The same under the fifty cent items; the same under the seventy-five cent items, and the same with the dollar items. I would like to know whether an inventory of that character would be considered as satisfactory with the insurance company.

MR. GALLAGHER: I should judge it would not be satisfactory.

MR. MAIN: If I may speak in answer to Mr. Lillie, it strikes me, with the experience I have had in the settlement of losses on the part of the companies in general, that the more accurate and the more complete it is, the more easily it will be found to reach a settlement that is satisfactory to the man who has met with a loss. The more general it is, the greater the opportunity will be for the insurance company to dicker with you and make you believe that you should take less than you think you ought to have; therefore my conclusion is that the more complete the inventory is the better it will be for the insurer when he is settling with the insurance company on a fire loss.

MR. MASON: I do not feel like insisting on a lump amount. Mr. Hynson and Mr. Main represent very large business interests and have had large experience. Now, there is often a practical difference between the methods that are used by large concerns and the methods practical for small concerns. Double entry bookkeeping is properly insisted upon by large houses, but with the average retailer with sales of perhaps \$10,000 per year, it is too complex. Now, possibly there is the same difference between the methods of inventory taking. The great trouble I find by correspondence is that most druggists will not take an inventory at all because they think it is too complex; indeed it is a difference between not taking an inventory at all and such an inventory as I suggested of lumping certain classes of items.

Some druggists will insist upon a more thorough record, and if they do it would be very wise for them to do so.

Now, Mr. Pease suggested that in extending his figures for the value of the stock, he always estimates the original cost of the stock and not the present value of it, the present market value. The theory is, that depreciation on one hand will about equal appreciation on the other. Now, with all due respect to Mr. Pease, he is a very successful business man, but it seems to me that it is rather careless and unscientific, and I venture to say, rather inaccurate.

I made a note here referring to the element of time in taking an inventory, but that has been pretty well covered. In taking an inventory, Mr. Gallagher said he began at nine o'clock in the evening and finished at three o'clock in the morning, when he expected it to be a great task. In the large retail stores of the country, with most of which I am pretty familiar, having visited them all in the last three or four years, I find the same remark is true of every large concern, whether drug concern or other concerns, they have to get at it vigorously, and keep at it all night long, if necessary, perhaps keep at it until five or six o'clock in the morning. It is pretty hard, but it is not harder than we have been doing, and it is worth doing it for one or two days a year, and that time may be selected when sales are slow; the customary time with almost everybody is, right after the holiday season, when things are pretty dull, right after January.

Another point Mr. Hynson made, the additional advantage of the inventory. There are many additional advantages aside from getting the condition of your business and the rate of profit. The one is the value of your stock in case of fire loss, another is knowing the value of the stock every year. It always surprises you to learn of a list of stock that is not selling. Put it in the window and sell it out and get rid of it or send it back to the wholesaler if he is willing to accept it and replace the stock, keep your money moving, turn it over as often as possible. That is one of the great advantages of at the end of the year finding out a great many things you didn't know you had before.

Mr. Diner spoke of the Department Records; I didn't speak of that, I confined myself to the inventory; but in trying to find out the profits realized, Department Records are absolutely necessary. Mr. Diner said he kept a record of his cigars and a similar record of his soda and so on, covering purchases and sales; and if a department did not pay a profit, he threw it out.

MR. DINER: No, I didn't say that; I tried to boost it first.

MR. MASON: Well, perhaps I misinterpreted Mr. Diner; but a great many druggists go on that assumption, that if a thing is not profitable, throw it out. There is a fallacy there. If your percentage of expense is 25, say, 30 I suppose is the average, and if the cigars pay 25 per cent., the first thought is you are losing 5 per cent. and you must get rid of the cigar department. Now, that is a mistake, unless you can put something else in the cigar department that will net returns. Why? Because by throwing out the cigar department you are reducing your total volume of sales while your expense remains stationary, and you increase your percentage of expense and reduce your total profits by throwing out the cigar department. Probably few druggists make a profit on the patent-medicine business, but it serves to increase the volume of sales and reduce the general percentage of expense.

MR. ANDERSON: After this full discussion it appears there is very little to be said. I agree with those who favor an inventory and believe it is one of the essential features of a correctly conducted business, both for its value in estimating profits and also for protection in case of fire. I also believe that the more perfect or exact the inventory, the better it is at all times.

Mr. Hynson, however, raised a point in reference to the inventory being destroyed by fire, as very frequently druggists take an inventory and then leave it somewhere in the store; I have found them leaving it in a desk that would be burned up if the store burned down at night. I believe it is very good practice to select books that come already prepared and can be procured at a stationer's, in which you can take the inventory in duplicate. I find that is the safer way, so that one copy may be kept in case the other is destroyed, as of course it is likely to be destroyed by fire.

THE CHAIRMAN: The subject that has been before us is extremely interesting. It is one that I have purposely allowed to be thoroughly discussed, because any business man, in order to do a successful business, must keep a thorough and accurate set of books. In all losses in case of fire, he must present to the insurance companies a correct record of his inventory, or one that will be satisfactory to them, in order to recover his loss, and for fear that you may fail to have time to discuss the paper that is yet to come, I will ask you for a disposition of this paper.

Upon motion of Mr. Diner, seconded by Mr. Main, the paper was referred to the Publication Committee.

At the request of the chairman, Mr. Freericks then read the following paper:

POINTERS ON FIRE INSURANCE.

BY FRANK H. FREERICKS.

It is the purpose in this paper to dwell as briefly as possible on some of the more important features of fire insurance of interest to pharmacists, including:

1. The insurance contract.

2. What and how to insure.
3. Where to insure.

THE INSURANCE CONTRACT.

The insurance contract, which is generally known as the insurance policy, is without question most deserving of careful consideration. It includes not only the printed form, but every word either written therein or attached thereto. Its importance can possibly be best impressed by having every insurer regard it as a contract which involves one, two, three or five thousand dollars, as the case may be. An insurance policy should be accepted exactly as would the entering into of a contract involving a sum equal to the amount for which it is to be made.

A Safe Policy.

An insurance policy should be first of all a standard policy, that is to say it should be a policy the terms of which are based on a standard as fixed by law. Any insurance policy other than that of standard form should be carefully avoided. Not that non-standard policies may not be equally safe, or even more liberal in terms, but rather because they may not be, and therefore they cannot be accepted with assurance of proper safety unless submitted to an attorney, as in the case of entering into any other important contract. As stated, the advantage of a so-called standard insurance policy is found in the fact that the standard is fixed by law. Its terms are based upon careful study and consideration which the subject has received from law-making bodies of various States, which study and consideration have been given primarily in the interest of and for the protection of the public. In accepting a standard policy, therefore, you have the assurance that its terms have been prescribed and are recognized to be for the purpose of doing equal justice to both the insured and insurer, while in accepting a non-standard policy you have only the assurance of the company that its terms are just and honest. Among the various standard insurance policies as prescribed by different States possibly none is in such general use as that of the State of New York. In fact all of the various standard policies, which include those of the State of Maine, Massachusetts, Michigan, Minnesota, Wisconsin and a number of the other States, are largely copied after the New York standard, and vary from it to but a slight degree in the more essential features. The standard policies of Connecticut, New Jersey, Ohio, Pennsylvania, Rhode Island and of a number of other States are an exact adoption of the New York standard. There are, however, many States, and we would be inclined to say most of them, that have not adopted and prescribed a standard form. It is in just these States where the insurer of property should be especially careful to know that the policy offered is fair and honest in its terms. Legitimate and reputable insurance companies make it a practice there to use the standard form of some other State, usually the standard of New York. On

this subject we would say that a policy can never be of recognized standard form if its terms impose liabilities in addition to the premium paid, unless it be a mutual policy, and then it will contain the words "mutual policy."

Its Meaning.

Every line of the printed part of an insurance policy has a definite and important meaning. Time, however, will not permit our entering into the subject further than to point out those of special interest. Of possibly greatest importance, most far-reaching in effect and most frequently ignored is the following provision, which is either expressed or found by necessary implication in every standard policy :

"No officer, agent, etc., can waive any provision or condition of the printed portion of a policy unless the terms and conditions are subject to agreement, and is specifically set out in the printed part of the policy. If any agreement is made with regard to terms and conditions, which according to the policy are subject to agreement, then and in such case, such special agreement must be written in, or attached to the policy."

This clause, expressed or implied in every standard policy, has an intimate connection with every part thereof. We learn from it that certain conditions of the printed form may be qualified by agreement, while certain other terms and conditions are not subject to waiver or qualification of any officer or agent of the company. What are the conditions subject to waiver and what conditions are not subject to waiver? Any policy holder who is not acquainted with this feature of his policy may frankly admit that he has bought something which may turn out to be a gold brick. As briefly as possible we will endeavor to enumerate the more important of both classes. Bearing in mind that those terms and conditions of the printed part of a policy which are subject to waiver and agreement, *can be so qualified only by being written in or attached to the policy*, and that they can, under no condition, be qualified verbally, we find, that unless so qualified, every insurance policy is absolutely null and void :

1. If the insured has, makes or procures any other contract of insurance, whether valid or not, on the same property.
2. If the hazard be increased by any means within the control or knowledge of the insured.
3. If mechanics be employed in building, altering or repairing the same, for more than fifteen days at any one time.
4. If the interest of the insured be anything but unconditional ownership.
5. If the subject of insurance be a building on ground not owned by the insured in fee simple.
6. If the subject of insurance be personal property and be or become, incumbered by chattel mortgage.
7. If, with the knowledge of the insured, foreclosure proceedings be commenced or notice given of the sale of property insured, by virtue of any mortgage or trust deed.
8. If any change, other than the death of the insured, take place in the interest, title or possession of the property insured, (except change of occupancy without increase of

hazard), whether by legal process, or judgment, or by voluntary act of the insured, or otherwise.

9. If the policy be assigned before loss.

10. If the illuminating gas or vapor be *generated* in the building (or adjacent thereto) for use therein.

11. If (*any usage or custom of trade or manufacture to the contrary notwithstanding*) there be kept, used or allowed on the premises, either benzine, benzole, dynamite, ether, fire-works, gasoline, greek fire, naphtha, nitroglycerin or other explosives, etc.

12. The company shall not be liable for loss by lightning or explosion, unless fire ensues, and then for the damage by fire only. (Some standard policies now provide for paying of all damage caused by lightning).

The importance of a strict observance of the foregoing conditions cannot possibly be over-estimated. A violation of them makes of an otherwise sufficient indemnity contract an instrument of less value than the paper on which it is printed. The provision most frequently disregarded by pharmacists is that which governs the handling of explosive and inflammable material. The verbal assurance of agents is accepted contrary to the express provision of the policy. Thus pharmacists preclude themselves from proper protection not only under the first contract made, on the strength of such verbal assurance, but under every other policy they may subsequently secure. No insurance company will accept the risk of granting special conditions when other companies have failed to do so, for the simple reason that they may thus take the chance of shouldering the entire burden in case of a loss, to the face value of their policy. Under no circumstances should pharmacists take the chance of violating any of the foregoing conditions, subject to waiver by insurance companies. It is possible of course that such violation will be overlooked in cases where the violation has not directly caused or added to the loss (the Michigan Standard Policy with reference to inflammables provides for such, in specific terms) but the risk in running such chances no insurer of property can afford to take.

Coming now to the second class of conditions in the printed form of Standard Policies, that is, those which cannot be waived either verbally, or in writing, by any officer or agent of an Insurance Company, we would enumerate as of greatest importance the following :

1. The company cannot be liable beyond the actual cash value of property at the time any loss or damage occurs, and the loss or damage shall be ascertained or estimated according to such actual cash value with *proper deduction for depreciation however* caused etc.

2. That the entire policy shall be void if the assured has concealed or misrepresented in writing or otherwise, any material fact or circumstance concerning the insurance or the subject thereof; or if the interest of the insured in the property, be not truly stated in the policy; or in case of fraud or false swearing by the insured touching any matter relating to the insurance or the subject thereof, whether before or after loss.

3. That the Company shall not be liable for loss caused directly or indirectly by invasion, insurrection, riot, civil war or commotion, military or usurped power, or by order of any civil authority; or by theft.

4. The Company shall not be liable for loss caused directly or indirectly by neglect of the insured to use all reasonable means to save and preserve property at and after a fire or when the property is endangered by fire in neighboring premises; or by explosion of any kind.

5. If a building or any part thereof shall fall, except as the result of fire, all insurance under the policy on building or contents shall immediately cease.

6. The company shall not be liable for a greater proportion of any loss on the described property, or for loss by, and expense of removal from premises endangered by fire, than the amount hereby insured shall bear to the whole insurance, whether valid or not, or by solvent or insolvent insurers, covering such property.

It is apparent that absolute honesty and truthfulness is one of the first requirements for the making of a valid insurance contract, as well as for the making of a claim in case of loss. No conservatively managed insurance company pays out its money without being satisfied that it is being fairly and honestly dealt with. Every effort is made to be in possession of the full truth both when the policy is issued, and naturally even more so when a loss is incurred. The most scrupulous honesty is always advisable with relation to fire insurance.

The Written Portion and Rider.

The written parts of an insurance policy are those which every policyholder is likely to read. Usually they express the face value of policy, the property insured, the premium charged, the name of insured, and the term for which the policy runs. Sometimes the written portion also expresses an agreement waiving one or more of the terms and conditions which are subject to waiver by agreement, but more usually such waivers are in printed forms and attached to the policy. These are properly known as riders, and may also enumerate the property insured, instead of it being written into the policy. Besides setting out the actual value of a policy and the agreement regarding conditions, which are subject to agreement, under the printed form, the written portion and riders of an insurance policy are especially deserving of notice for the reason that in them are frequently contained a qualification of the insurance contract, which the insurance companies regard as of greatest importance, namely, the co-insurance clause.

Co-Insurance.

Co-insurance is designated either by that name, as reduced rate average, or three-fourths value. It means that the insurer assumes a part of the risk. The matter of co-insurance is generally misunderstood and subjected to a prejudice which has resulted in frequent legislation against the use of co-insurance clauses in policies. Correctly applied it should be the means of providing the greatest measure of fair insurance for the insuring public.

The practicability, advantage and necessity for co-insurance is regarded from various view-points by insurance authorities, based largely on some

reason for applying it in a particular class of cases. There are three principal grounds or rules aside from the hazard, which govern the price and sale of fire insurance, and which require a consideration of co-insurance.

1. That insurers on only a part of their property value, under a straight policy, receive an advantage as against insurance companies, for which they should pay an increased premium rate.

2. That co-insurance from any amount over 50 per cent. of the property value, when expressed in the policy, is most fair to the company, to the particular persons insured, and to the insuring public, for the reason that it offers the best means for correctly fixing the premium charge.

3. That co-insurance should be invariably enforced on risks which have no fire protection, so that the lack of fire protection will be partly made up by the only partly insured, in a greater effort to save his property from fire loss.

The theory which governs the first and second rule is found in the fact that out of every 100 fires, 90 result in a loss less than 50 per cent., while only 10 result in a loss of more than 50 per cent. of the property value. Insurance authorities contend that a person who insures only a part of his property value runs only ten chances out of a hundred of not having his loss entirely indemnified while the insurance company runs ninety chances out of a hundred of having to indemnify the entire loss incurred. Thus they argue that in all such cases the insurance companies lose the premium which would otherwise be paid on the uninsured property, and in 90 cases out of the hundred, they have to pay the entire loss which is incurred.

The argument thus made is logically correct, and should in practice lead to the following results :

1. An expressed co-insurer from below the full 100 per cent. of the property value down to 50 per cent. of the property value, should have a decrease in premium rate in proportion to the amount of co-insurance which he carries.

2. An insurer of property who insures its full value, should have a better premium rate than the person who insures only a part of his property value under a straight policy.

The former theory invariably works out, and is largely put into practice, while the latter, though undoubtedly correct, is not so generally put into operation.

The thirdly enumerated ground for co-insurance, that is, the so-called moral hazard in risks without fire protection, is one upon which great stress is laid under the requirement for a three-fourths value clause. Insurance companies, wherever the law permits, will refuse to write a policy on such risks, without it containing the three-fourths value clause. While some authorities profess to doubt the beneficial effect of such a clause, it nevertheless seems reasonable that a property owner who knows his property to be insured to only three-fourths of its value, will exercise greater care and precaution to prevent fire loss, and the writer believes that generally speaking, it has such an effect. This reasoning also applies to those cases in which

expressed co-insurance is optional with the insured, and should thus be an additional ground for a lower rate of premium.

Is Co-Insurance Advisable.

Having given the theory of co-insurance, the question arises, is it advantageous to the insured?

The advisability of co-insurance for the property owner must first of all be governed by his financial condition, but to this we will refer later. Having co insurance in mind as such, and without ulterior reason to control it, we would say that in a moderate degree it is advantageous to the property owner. We say in a moderate degree, for the reason that we consider indemnity to a safe extent, as far more important than the saving on premium rates.

An 80 per cent. co-insurance clause under which the property owner is a co-insurer to the extent of 20 per cent. of the property value, is figured to entitle him to a decrease of 10 per cent. of his entire premium; the amount of decrease, however, usually runs to 15 per cent., though such reduction is regarded as too great. Figuring, for example, on the insurance of \$500,000.00 worth of property under the 80 per cent. co-insurance clause, leaving \$100,000.00 worth of property which the owners thus insure themselves, it is possible to ascertain the approximate relative saving. On drug store property the average premium rate may reasonably be fixed at $1\frac{1}{4}$ per cent. This makes a premium of \$6,000.00 on \$400,000 of property. The reduced rate granted because of an 80 per cent. co-insurance clause may be given at 15 per cent. on the \$6,000.00 or \$900.00. Adding to this sum the amount of premium saved by not insuring the \$100,000.00 or other 20 per cent., we find that the total saving is $\$1,250.00 + \$900 = \$2,150.00$. Against this gross saving must be set off, first, the average loss on property, which on drug store property is estimated at \$326.00 annually for each \$100,000.00, while on property in general it is estimated at \$400.00 on \$100,000.00 annually. Secondly, the sharing of a 20 per cent. loss on the other \$400,000.00. The total estimated loss for \$100,000.00 being \$326.00 annually, it is \$1,304.00 on \$400,000.00. Twenty per cent. of this amount is \$260.00, making the total estimated loss without indemnity $\$260.00 + \326.00 , that is, \$586.00. It is thus found that the net estimated saving in premiums by use of the 80 per cent. co-insurance clause on \$500,000.00 amounts to \$2,150.00 less \$596.00, which is \$1,564.00. By use of the 80 per cent. co-insurance clause druggists owning \$500,000.00 of insurable property have a net annual saving of \$1,564.00. We would therefore conclude that co-insurance to a moderate extent is both advantageous and advisable.

Realizing that a more exhaustive treatment of the subject will not be of sufficient interest, fearing even that your patience has already been taxed, we will now briefly consider those features of insurance which should be of interest to pharmacists aside from the Insurance Contract.

What and How to Insure.

These questions must naturally be uppermost in the mind of every insurer. As with every other business transaction, if not founded on correct principles, the placing of insurance, will mean the annual waste and loss of money, or the possibility of serious disappointment.

Invoice.

It is simply impossible to intelligently insure against fire loss without an annual invoice, and, it is also impossible to properly adjust a fire loss without such invoice. The man who knows the value of his insurable property is bound to save money each year in the expenditure of premium, and if, at some time, he should have the misfortune of a fire, he cannot help but profit in the adjustment of his loss. An invoice is essential above everything else. When made, it should be on correct lines. Depreciation in value should be allowed for. The man who purchases store fixtures for \$2000, and then year after year insures them for that amount, is annually losing some money in premium paid without securing indemnity. He overlooks that important provision in his insurance contract, which makes it impossible to recover more than actual loss, with proper allowance for depreciation in value.

Having intelligently ascertained by invoice what to insure, it becomes comparatively easy to know how to insure.

Remembering that fire insurance is indemnity, the question is how much indemnity do you need or how much do you want. The man without debt can decide how much he wants, the man with substantial debts must decide how much he needs. A classification may here best serve to demonstrate.

1. The class which has but a small portion of its resources invested in the drug-store.
2. The class which has substantially its entire resources invested in the drug-store but is without liabilities.
3. The class which has all its resources invested in the drug-store and carries heavy liabilities on them.

The first class can regard the matter purely from an indemnity standpoint. A conservative business policy should make it desirable for this class to carry insurance on at least 75 per cent. of the investment.

The second class must be partly guided by the indemnity it wants, and by what it needs. No one who has his all invested in the drug-store can afford to subject himself and his family to the chance of losing a great part of it. He can, however, share a part of the risk for the consequent saving in premium. Generally speaking, those who belong to the second class can properly, safely, and with profit, insure under policies containing an 80 per cent. co-insurance clause.

The third class referred to has no option in the matter of correctly in-

sure. This class should invariably insure up to the true property value, or as near thereto as the business policy of insurance companies will permit. The insurer of property largely indebted is obliged in justice to his creditors and to himself to have as complete an indemnity as it is possible to secure. While creditors will usually look to protection sufficient for themselves, the debtor in such case must constantly bear in mind that insufficient indemnity on his assets, above liabilities, may interfere with his securing a new start in case of a total loss. It seems therefore not only logical but necessary that those of the third class secure full insurance if possible.

Where to Insure.

This brings us to a consideration of the last proposition which we have undertaken to present. Where to insure, all will agree depends largely as does the purchase of anything else, on quality and price asked. Accepting this as understood, we would say the safety of an insurance company can never be measured by its capital alone. A company with a capital of a million dollars may not be as safe as one with \$25,000. Wide distribution of risks is of first importance, next to that of having a sufficient capital. Avoid companies which take a large number of risks in congested districts; avoid companies which have no capital, and which seek to indemnify only with the premium received from policy-holders. Mutual companies having an established reserve fund and doing a specialty business are quite as safe as capital stock companies, but do not accept the risk incident to enabling a mutual company to establish such reserve fund, it may turn out well, and then again it may not. Having these points in mind and being satisfied regarding them, it is an easy matter to place one's insurance where it will be what it is intended to be, a true contract of indemnity.

MR. MAIN: I move that the paper be referred to the Publication Committee, to be read with great care, as it presents this most important subject in a most concise and correct manner.

MR. HYNSON: I would like to rise to second that motion. I sometimes feel like absenting myself from these meetings so I will not take up too much of your time, but this matter is one of great interest to me.

Mr. Mayo, soon after the Baltimore fire, requested me to write an article on "Insurance," and feeling the responsibility of it, although I was full of insurance losses, my own and those of my friends and enemies, still I went on and prepared a paper which was published in the "American Druggist" in the early part of 1904, in which I had the assistance of insurance adjusters and an insurance attorney, friends of mine, and after you have read this paper and studied it, if you will pay me the honor to look up that article I shall be very glad, although Mr. Freericks has elaborated the subject very much more than I did.

There is one thing I want to call attention to. Although I am in business a long time, and had used a standard policy, not until that time did I realize I was violating that policy by keeping ether and benzine, and then I proceeded to consult our insurance

agent, and now in every policy we have the special privilege of keeping five gallons of benzin on the roof of our rear building on the outside in a tin can, and we are allowed to keep, store and sell ether in certain quantities, to be used for medicinal purposes only, and I feel that I am secure because every policy has that special endorsement. I am afraid some of you have not looked into that, so it behooves you to look into your policy very carefully.

I will not occupy any more time except to say that in the work of commercial teaching I dwell upon this matter a great deal.

MR. APPLE: I have had some experience with this question of the special privilege of keeping benzin, etc., which are contained in standard policies. Our underwriters at Philadelphia used to be a great deal more liberal in that respect than to-day. They did not restrict the amount of benzin, ether and naphtha; we could keep it in our store. They are now restricting us so that we can only keep five gallons altogether of ether, naphtha or chloroform.

MR. BENFIELD: I spoke about having three fires; I am happy to say they were in three different places, three stores. In the last one it happened to be a matter of a property, of which I owned both the building and the fixtures, which was on leased ground. Mr. Freericks spoke of property on leased ground being one of the conditions, and there was a clerical error in the writing of the policy; the fact was omitted that it was on leased ground, and not until the fire occurred did I discover that, because I had neglected reading the policy and comparing it with the previous policy issued on the same property. Fortunately for ourselves, in substantiating our loss, I kept the old policy in which I had that provision, and the same agent had renewed the policy. Consequently, I had no trouble in securing my payment, but only because the previous policies had it; I proved that it was simply a clerical error that had been committed by the agent issuing the policies.

Regarding the matter of fixtures, again, I found it is absolutely necessary that certain items should be specifically mentioned, and much to my surprise, the item which enabled us to get a better premium rate, was one of the items that had to be particularly mentioned as part of the insured fixtures, and that is fire extinguishers. We had about fifty fire extinguishers at the time of the loss, which occurred in the middle of the day, and they were used until the clerks were driven from the store, that is, those that they could get at; but the company would not allow us a cent on the cost of those fire extinguishers, simply because they were not mentioned.

Another item was the clock, of which every store has one. Now, there were several other items that I cannot recall unless I had the policy before me; but we happened to have a clock of some value, and we considered it worth insuring, but when the general item of fixtures was mentioned, unless the clock was in and unless the fire extinguishers were particularly mentioned, they were not allowed.

Regarding the matter of the benzin, etc., one gentleman spoke of ether, I don't know how much ether I am allowed to carry; we keep not exceeding five pounds as a total stock. But in the matter of benzin, in order to keep within the limit of five gallons, it is a matter of precaution that we have to be very careful about. Our policies all specify we are allowed five gallons, but we are in a territory where the Standard Oil Company have quite a stroke, and particularly as to the guarantee of a very thoroughly deodorized article, which is put up in half pounds and sold for dry cleaning, we carry that article in stock of about one case of each. We have to guard ourselves pretty carefully, that we don't exceed that five gallons, because pounds and quarts count up pretty fast, and we keep a little of ordinary petroleum ether, but we only have one gallon at a time, even then we find ourselves occasionally exceeding the limit, so we have to take special precaution regarding storage.

I would like to ask if such a stock as the one I have just mentioned, which is marketed under the name of "Energy" would be considered as part of our benzine. We have also one or two mixtures which contain benzine. I presume the new Food and Drug Act might take care of that, but the matter of ether, I would like to ask Mr. Hynson what quantity is permitted in his establishment.

MR. HYNSON: I don't remember exactly what the quantities are, but we buy it and sell in pretty large quantities to the hospitals and the colleges, and the fact that it is for medicinal use seems to help us a great deal more than if it was used for other purposes. I can't remember the amount or I would let you know.

MR. PEASE: You ought to have a printed form for your policy; consult your agent and then have two or three hundred printed at one time.

THE CHAIRMAN: A motion has been made and seconded that this paper be received and referred to the Publication Committee. Are you ready for the question? All in favor of this motion, let it be known by saying aye; contrary-minded, no. The motion is carried.

THE CHAIRMAN: The time has arrived to nominate officers for the ensuing year; at the first session we nominate the officers and they are elected at the second session.

MR. HYNSON: I think if there is anything that helps an association it is rivalry for offices; I hope the representatives will not take that in an unfavorable sense. I take great pleasure in nominating for your Chairman Mr. Jacob Diner, of New York, who I think will be energetic and do a great deal for the Association along certain lines. (Seconded.)

THE CHAIRMAN: The next officer in line will be the Secretary.

MR. FREERICKS: Mr. Chairman, I believe we are all aware of the fact that within a year or a year and a half there has been added to the State Associations the Association of the State of West Virginia, and this new association has displayed a great deal of vitality and energy in the short time it has been in existence, and one of its active members I think is with us; I believe he is a member of this Association, and I shall therefore nominate him for Secretary, Mr. D. O. Young, of Buchanan, West Virginia.

MR. HYNSON: As other members seem backward, I would like to nominate for Associate Mr. Pease.

THE CHAIRMAN: Mr. Pease is nominated for Associate Chairman; Mr. Pease is from Nebraska. Now, according to our previous custom of election, we have a Second and a Third Associate.

A MEMBER: I nominate Mr. Benfield, of Cleveland, Ohio.

MR. HYNSON: I am going to venture again, and nominate Mr. Carter, of Indianapolis.

THE CHAIRMAN: Mr. Carter, of Indianapolis, is nominated as Third Associate. Are there any further nominations?

MR. HYNSON: I want it understood I am not trying to get my friends in office, but I am trying to help the Association.

THE CHAIRMAN: That completes the list, unless there are further nominations.

MR. GALLAGHER: I move that we now adjourn until three o'clock, and that at that time we take up the regular order of business, beginning where we left off.

Motion seconded and carried.

SECOND SESSION—THURSDAY, SEPTEMBER 5, 1907.

The second session of the Section on Commercial Interests was called to order by Chairman Kniseley at 3 p. m.

On motion of Mr. Gallagher, duly seconded, Mr. J. Diner was elected to serve as temporary secretary.

THE CHAIRMAN: We have about ten minutes. If there is anyone from any of the State Associations who has not made a report, we have about ten minutes and we should be glad to hear from anyone. As there are no reports from any of the delegates, I will entertain a motion that the reading of the minutes of the last session be dispensed with, as they were taken in shorthand, and we proceed to the business of the afternoon.

MR. BERGER: I make a motion that the reading of the minutes of the previous meeting be dispensed with. (Seconded).

THE CHAIRMAN: It has been moved and seconded that the reading of the minutes of the last session be dispensed with. Are you ready for the question? Those in favor of the motion, let it be known by saying Aye; those opposed, no. The motion prevails, and it is so ordered.

The next paper on our program is "Symposium on some National Formulary preparations." Mr. Diner submits "Elixir Terpini Hydratis cum Heroina." We will ask for that first.

MR. DINER: Mr. Chair and Gentlemen, I might say at the outset, that at the request of the Chairman I wrote a paper on this subject, with the idea of showing how I would prepare subject matter on this particular article for the purpose of making propaganda for National Formulary preparations among the physicians; so that you may not expect a scientific treatment of this preparation, but simply a propaganda view of it, as to how it should, in my opinion, be handled.

ELIXIR TERPINI HYDRATIS CUM HEROINA.

(*Elixir of Terpin Hydrate with Heroine.*)

	Metric.	Apothecaries'.
Heroine.....	0.75 Gm.	11 grains.
Elixir of Terpin Hydrate.....	1000. Cc.	32 fl. ozs.

Dissolve the heroine in the elixir.

4 Cc. (1 teaspoonful) contain 0.065 Gm. (1 grain) of terpin hydrate, and 0.0027 Gm. ($\frac{1}{24}$ grain) of heroine.

Average dose: 4 Cc. (1 fluidrachm).

NOTE. COMPOSITION AND FORMULA.

Heroine.....	0.75
Terpin Hydrate	17.50
Tinct. Sweet Orange	10.00
Solution Saccharin.....	1.00
Alcohol	400.00
Glycerin.....	400.00
Syrup q. s. ad.	1000.00

Explanatory. Heroin is the diacetic ester of morphine, occurring as a colorless, crystalline powder of a faintly bitter taste. Its action is similar to codeine, but it affects especially the respiratory functions.

Terpin hydrate is the product of a mixture of rectified oil of turpentine, alcohol and nitric acid. It acts upon the mucous membrane as well as upon the nervous system.

Uses. The combination of terpin hydrate and heroin is a particularly good one for the treatment of chronic bronchitis and in the advanced stages of acute bronchitis. The large quantity of alcohol employed is absolutely necessary to keep the terpin hydrate in solution, and is by no means a drawback, since it is very useful in the treatment of the above mentioned diseases.

The superiority of this preparation over any similar product of proprietary origin lies in the fact that the physician at all times knows just what amount of heroin or terpin hydrate he is giving his patients; and it is further emphasized by the fact that any pharmacist in the U. S. can fill a prescription for this preparation without delay, and *must* compound it strictly in accordance with above formula, else he, the pharmacist, incurs the liability of penalty by his Board of Pharmacy, should his preparation deviate from standard; an advantage which must not be considered too highly, since preparations of proprietary origin are subject to neither standardization nor inspection by any board of pharmacy or board of health.

J. DINER.

THE CHAIRMAN: Mr. Joseph L. Lemberger submits "Liquor Antisepticus and Antiseptic Powder." I will ask that this be submitted at this time.

MR. LEMBERGER: Mr. Diner, I think, has fully explained in his prefatory remarks, the possible use of such papers being presented in connection with the National Formulary preparations and those of the United States Pharmacopœia, with a view of familiarizing the physicians with the contents of those two very important books. Through the excellent arrangement of the Chairman of this Section, who very wisely divided the propaganda into a number of divisions and had a sub-head to each one, I say through that fact I was inveigled into the preparation, in a very mild way, of this paper. I am exceedingly busy at the present time, and on receiving notice of his desire to have me do some little work for this Section, I had to determine upon just what was wanted; and I presume I have, in a measure, filled the requirement by the paper that I will submit to the Section. It is a well-known fact that unless you bring the subject of a National Formulary and a Pharmacopœia—more particularly the Formulary, to the attention of physicians, the majority of them do not value the importance of those books. The paper which I have prepared is such a one as I intend to use for distributing these preparations, and others that may be suitable as information to the physician, with a view of emphasizing the importance of their using more particularly this liquor antisepticus in preference to any other known article, and particularly of a proprietary character. The value of these formulas depends upon the popularity of the articles with physicians.

Now I will simply read what I have prepared in that line for the benefit of the Section; I have also prepared some of the solution and brought some samples with me to show how we put up a small quantity.

Of course I shall be pleased to have the members of the Association take one of these leaflets along with them if they desire, and also examine the preparations that have been prepared and are presented with the paper.

I have an idea that if we diligently seek to inform the physicians of the fact that we have an ample assortment of all kinds of preparations to take the place of the so-called nostrums or proprietary medicines, they will gladly avail themselves of the use of them, and it is with this in view, in part, Mr. Chairman, that I have prepared this paper and to help on the good work of introducing these two valuable preparations.

LIQUOR ANTISEPTICUS, U. S. P.

(Antiseptic Solution.)

The formula composed of the following well-known ingredients, boric acid, benzoic acid, thymol, eucalyptol, oil of peppermint, oil of gaultheria, oil of thyme, alcohol, purified talc, water, as presented under this name, offers the physician a preparation in every way applicable in the place of similar preparations in endless variety of catch-names having a popular demand at an excessive price. On close examination you will find it a valuable mild antiseptic, based on the suggestions that have come to us from numerous sources. A formula for a preparation of the same character was made public in 1887, found in the *Apotheker Zeitung*: Sodium benzoate and sodium salicylate, with a portion of glycerin, using menthol in place of oil of peppermint, oil of eucalyptus in place of eucalyptol, thymol for oil of thyme. In this official preparation oil of gaultheria and benzoic acid replace the sodium salicylate and sodium benzoate, favoring a greater efficiency and elegance of preparation.

The name of a distinguished surgeon became the catch-word to popularize a compound made after the suggestion in the published formula, and has gained a large sale. The formula we now present has the value of official recognition, and this endorsement gives it therapeutic value as a local application, and will as such be appreciated by the physician.

It is valuable as an antiseptic, and is not repugnant to taste or smell. It can be prescribed in quantities by the physician to suit all requirements, the need and material circumstances of the patient. It can be used as a topical application for bruises, abrasions, burns, insect bites, sunburn, ulcers or sores indicating mild antiseptic treatment, mouth-wash as a corrector of fetid conditions, or antiscorbutic.

In recommending this antiseptic compound to the physician we have a desire to popularize it with the general public, who are not slow when informed of or educated to the use of any particular preparation to see its commercial value as compared with similar unofficial remedies.

ANTISEPTIC SOLUTION

U. S. P.

A useful remedy for Bruises, Skin abrasions, Insect stings. A good Mouth wash to correct fetid conditions. As a mild antiseptic it can be applied to all forms of sores and ulcers—as the doctor may direct.

PREPARED AT

LEMBERGER & Co.'s PHARMACY,

LEBANON, PA.

SAMPLE LABEL.

PULVIS ANTISEPTICUS

(Pulvis Antisepticus Solubilis)

SOLUBLE ANTISEPTIC POWDER

(National Formulary).

American Pharmaceutical Association.

This preparation, a combination of salicylic acid, phenol U. S. P., thymol U. S. P., eucalyptol U. S. P., menthol U. S. P., zinc sulphate and boric acid, is presented as a perfectly safe and valuable antiseptic, to be used dry, dusted with a powder puff or sprinkled in a more free way in the treatment of open sores or wounds, ulcers or abscesses, or added to water, diluted in accordance with the judgment of the physician. As a local application in the treatment of diseased parts that can be best served by the use of a douche, syringe or tampon.

It is also valuable in the sick-room as a disinfectant; the odor is not unpleasant.

This combination will appeal to the physicians as it secures for them a preparation which will serve them in place of the many similar indiscriminate mixtures offered them, the composition of which is usually secret.

SOLUBLE ANTISEPTIC POWDER

(NATIONAL FORMULARY).

Useful as a dressing for ulcers, sores, either in powder form, using a powder puff, or a teaspoonful mixed with 1 pint water, using the solution as a wash, gargle, or for internal use by douches or injection, as physician may direct. As a disinfectant for sick-room, use the powder freely.

PREPARED BY

LEMBERGER & Co., PHARMACISTS,

LEBANON, PA.

SAMPLE LABEL.

THE CHAIRMAN: We also have a couple of formulas submitted by Mr. Apple relating to the same subject. I will ask him to present them. There are four contributions in this symposium, and we will take them up *seriatim*, and after they are presented they will be open to discussion.

MR. APPLE: There are a number of physicians who requested us to express the composition of these preparations in both systems, because they were unfamiliar with the metric system, so we had to express it in both ways. We have specially avoided teaching the medical practitioner any therapeutics.

PULVIS PEPSINI COMPOSITUS (N. F.)

Compound Powder of Pepsin.

Pulvis Digestivus.

	Metric	Apothecaries'
Saccharated Pepsin (N. F. Appendix).....	15 Gm.	225 grains.
Pancreatin (U. S. P.).....	15 Gm.	225 grains.
Diatase	1 Gm.	15 grains.
Lactic Acid (U. S. P.).....	1 Cc.	15 minims.
Hydrochloric Acid (U. S. P.).....	2 Cc.	30 minims.
Sugar of Milk	66 Gm.	2 troy oz.

A fine cream-colored powder of acid reaction: having a peculiar odor and taste, suggestive of dried animal products.

Average dose, 1 Gm. (15 grains).

PULVIS ANTISEPTICUS (N. F.)

	Metric.
Salicylic Acid	5 Gm.
Carbolic Acid (Phenol U. S. P.)	1 Gm.
Eucalyptol (U. S. P.).....	1 Gm.
Menthol (U. S. P.)	1 Gm.
Thymol (U. S. P.)	1 Gm.
Zinc Sulphate	125 Gm.
Boric Acid, in impalpable powder	866 Gm.

A white or pinkish impalpable powder, possessing the agreeable, blended odor of its constituents; dissolves in cold and hot water.

THE CHAIRMAN: The next part of this paper, the symposium of National Formulary preparations, is a contribution by Mr. Hynson. If he has not entered the room, I will ask the Secretary to present this paper, so it may be read for your consideration.

The Secretary then read the following contributions by H. P. Hynson.

COMPOUND MIXTURE OF CHLORAL AND POTASSIUM BROMIDE.

(Mist. Chloral et Pot. Brom. Co. N. F.)

Each fluidrachm contains:

Hydrated Chloral.....	12 grs.
Potassium Bromide.....	12 grs.
Extract of Cannabis Indica.....	$\frac{1}{8}$ gr.
Extract of Hyoscyamus.....	$\frac{1}{8}$ gr.

A convenient form of administering this popular combination. It may be mixed with an equal quantity of syrup of orange or simple elixir and made more agreeable to the taste.

NOTE. Some combinations of chloral, potassium bromide, etc., have become very popular under various trade names and seem to meet the demands of a large number of physicians, and the committee in charge of the National Formulary has thought it wise to add such a mixture to the list of preparations contained therein.

This mixture has been carefully formulated, and presents a complete solution of all the ingredients, making it possible to administer these in definite quantities; this is rather difficult, considering the presence of *cannabis indica*. In this instance, the chloral hydrate facilitates the solution of the resinous matter.

The taste of the preparation may be greatly improved by adding an equal quantity of syrup of orange peel or simple elixir, in which case, of course, the usual dose should be doubled.

Physicians using this product should keep in mind the tendency of chloral hydrate to produce habitues, and also should be mindful of the susceptibility of some individuals to the hallucinating effect of *cannabis indica*.

COMPOUND SYRUP OF HYPOPHOSPHITES, U. S. P.

(*With Quinine and Strychnine.*)

Each fluidrachm contains :

Hypophosphite Calcium	2 grs.
Hypophosphite Sodium	1 gr.
Hypophosphite Potassium	1 gr.
Hypophosphite Manganese	$\frac{1}{8}$ gr.
Hypophosphite Iron	$\frac{1}{8}$ gr.
Hypophosphite Quinine	$\frac{1}{8}$ gr.
Hypophosphite Strychnine	$\frac{1}{16}$ gr.

Dose.—One to two teaspoonfuls.

NOTE.—There is no doubt but that the usefulness and desirability of a preparation of "tonic" or "hematic" hypophosphites is fully established, and the syrup as formulated in the Pharmacopœia is generally satisfactory.

This preparation is a distinct pharmaceutic achievement; it represents the salts as true hypophosphites, kept in this form by the presence of a small quantity of hypophosphorous acid, which also serves to keep the alkaloids in solution. The iron hypophosphite is made soluble by the presence of a nicely adjusted proportion of sodium citrate, care being taken that no excess of this is used, in which case calcium citrate is formed, which, being sparingly soluble, is usually precipitated. The highly concentrated syrup prevents fermentation which occurs in preparations of the kind containing less sugar. It will also be noticed that the alkaloids are in perfect solution, which may be doubted in regard to cloudy syrups. In cases where the sugar is objectionable, the compound solution of hypophosphites of the National Formulary will be found to take the place of the official syrup.

THE CHAIRMAN: This completes the contributions upon this subject. The paper is now before you; what is your pleasure?

MR. DINER: Before we enter upon a discussion of this subject I would like to ask the courtesy of the privilege of the floor for a gentleman who has just now come into the room, a representative of the medical profession, and one of the representatives whom

pharmacists do always welcome, because he has always been in accord with the desire and the work done by pharmacists to bring the two professions together, and because he has done more to advance the popularity of the United States Pharmacopoeia and National Formulary preparations than any physician I know of. He is also distinguished no less in his own Association by having been made a member of the Formulary Revision Committee, and proves thereby that he is not only a man intelligent in prescribing but a man of deep learning and fit to act in the councils of the profession. I ask the privilege of the floor for Dr. Thomas F. Riley, of New York.

THE CHAIRMAN: Dr. Riley, we are pleased to have you with us.

DR. RILEY: Gentlemen, it has been my good fortune on a number of occasions within the past few years to meet the pharmacists in various parts of the country, and I have been more than surprised by the amount of intelligence displayed by them. I certainly have never met a medical society in which the good scientific work has been done that you are doing to-day. Such a thing would be impossible for us in a medical society in New York City—I may say the same of all over the country—to do any sort of scientific work. There would always be a ball-game instead of attending to business.

The subject under discussion is an old subject with me, because I have pleaded with physicians in the society and with pharmacists as well, so that the matter is an old one, as I said before. We in New York, probably more than in any other part of the country, with the exception of St. Louis, have been accustomed to use proprietary medicines. The National Formulary was never mentioned in the medical schools in this city. I am almost certain in the past fifteen or twenty years there was no such thing known in the medical schools of New York city as a National Formulary. I myself became acquainted with it at one of the American Medical Association meetings at Atlantic City some years ago, when your organization sent some small circulars around to the members. It was certainly an illumination to me, and a source of a great deal of profit as well. The medical profession do not know the value of these preparations; the average physician does not. In New York city, in my neighborhood, your secretary has been very active in explaining to the physicians and sending around samples to them to show that this work can be done. I can say from my own experience that the National Formulary prescriptions are multiplied dozens and dozens of times over what they were two years ago. Before this work was started, physicians would rather prescribe National Formulary prescriptions if the name was not too long for them to remember it. A physician practicing ten or fifteen years ago knew nothing of them; he took what the druggists brought him as a preparation pleasing to the palate and satisfactory to the therapeutic indications as far as he knew; he used them; the patient was pleased and the doctor was satisfied. Now, your preparations are, every one of them, the equal and often many times the superior of these proprietary preparations in appearance and in taste, and certainly more so in therapeutic value, and I know the physicians in my own neighborhood are prescribing them time and time again.

There is another phase to the work of the pharmacists which I want to call your attention to, and that is it heads off the proprietary. I don't think that the men personally are guilty of this, but I know in some parts of the city this fault has arisen; druggists have seen how easily people are gulled into believing in the value of nostrum solutions and various things, and they have themselves turned around and put labels of various kinds on their bottles, and it tends toward self-medication. Sometimes it seems to me it might be wiser if the druggists would confine themselves to a purely scientific statement of the facts. In one of the papers just read the ground has been taken to let the public use the preparations, if they know what the uses of those things are, but it hardly seems to me that it is our province to advise them what to do. It is a hard

matter to draw the line, but if one wishes for ideals, we might as well state them. Of course, this is much less important for external applications than for internal applications.

The best method, it seems to me, of presenting this matter to the profession of medicine would be to follow the example that has been set here in New York in meeting physicians, going to their meetings and reading papers such as we have heard just now. That paper should be heard in every medical society in this country and if it should be heard there, it would be very gladly welcomed. It would bring to the attention of physicians the value of the National Formulary by choosing a few preparations of that kind that would appeal to them, if necessary, showing them the work, giving them the demonstration of the work and possibly making some arrangement by which they can get the National Formulary; they don't know the book exists. They know the Pharmacopoeia exists, but they don't want that. The National Formulary would be welcomed as an addition to the library shelves of most of the physicians of this country.

MR. WILBERT: I would like to call attention to the little booklet that the Philadelphia branch of the American Pharmaceutical Association issued in connection with their exhibition at Atlantic City last year, and in the front I have placed a few samples of labels which were used at that time, illustrating the style and type of label we had. The matter is too extensive to go through in detail, but the individual members can get an idea of what was done at that time in connection with the National Formulary and the Pharmacopoeia propaganda work. I would like to call the attention of the members to that, and that the American Medical Association has recently issued a manual designed especially for physicians' use. Every member of the Association should get a copy for himself so as to get acquainted with it. If you get a copy for yourself, I am sure you will invest in a sufficient number to give them to the physicians. It is probably the best thing that was ever issued along those lines by the American Medical Association.

MR. HYNSON: When I got the circular letter asking me to contribute to this symposium, I was very much pleased, and while I felt I was to be but a small portion of the symposium the gentlemen of the Committee had originated, I willingly undertook to write a short paper. At this moment I am in sorrow, for I expected to see a hundred or more preparations treated in some such manner as I tried to treat the two that were assigned to me. If there is any work that might be effective in connection with the National Formulary, I think it would be to have the associations make some such contributions as these, and then let them be referred to the Committee on National Formulary, and by it prepared for the use of members. This would save trouble, and I believe would be quite desirable. It seems to me that this is the object our Committee had in mind.

In regard to the manner of exploitation, I believe there is no necessity for putting "therapy" of any kind on the label. We have a large number of preparations for physicians' use and you cannot find anything relating to their use on the labels. These make no reference to the therapy, but to the contents, and that is what the physician wants, and that is the idea I think ought to be carried out. I am bringing the matter before the Association because I believe the line of work suggested by the Committee this year should be continued by the Section next year.

THE CHAIRMAN: I desire to state that in my work as Secretary of the Board of Pharmacy in my territory, in going around from place to place, I find in a number of drug stores the proprietor complaining that a physician did not write as many prescriptions as he should. He said: "Any time I go into my doctor's office I find a lot of sample bottles of stuff that has been contributed by one manufacturing chemist and another and another. The physician takes these up and dispenses them out and uses them in his practice." I said to a number of them, "Why didn't you pick out something better than

that that accords with the National Formulary and give them to your physician, and show him you are competent to make as good preparations as these manufacturing houses?" and I thought it would be a good idea if our Association should write to the secretaries of the associations all over the United States asking them to present this at the State meetings, and asking them to urge upon the members of the State Association to take this matter up and manufacture on their account some few preparations from the National Formulary and bring them to the attention of physicians so as to induce them to use those preparations instead of those which have been so freely distributed by manufacturing houses throughout the United States.

MR. GODDING: In Boston the Boston Retail Druggists' Association takes up this work as an association and we prepare these preparations individually, and our object has been not only to educate the physician to the use of National Formulary preparations but our own members, and we have succeeded very well. We get out or intend to get out one preparation every month except the summer months. The material is paid for by the Association and the individuals that participate in this work buy the material for their own work.

MR. DINER: I am glad to hear from Dr. Riley as to the actual requirements of the medical profession and appreciation of our labors and our literature, by refraining to tell the laity how to treat disease. We started out with the intention only of bringing to the attention of the medical profession certain remedies and formulas contained in these standard books, and in order to do so after sending out a general letter, laying down the purpose of the propaganda that has been instituted, we send out monthly letters, taking up one, two or three preparations, sometimes more, giving nothing but the formula and a short treatise on the use of it in that pamphlet, but the label contains nothing but the official title and the formula. There was no indication on the label as to what kind of disease that human flesh is heir to, could be cured by that remedy, and we find physicians take to it and the financial returns to the pharmacists are large indeed, and I hope that the returns to physicians from this kind of work are equally grateful, which I think they were.

MR. APPLE: I would like to take exception to some of the recommendations of Mr. Lemberger on the method of introducing the antiseptic solution and the same as to the antiseptic powder. It states here: "In recommending this antiseptic compound to the physician, we have a desire to popularize it with the general public, who are not slow when informed of, or educated to the use of any particular preparation to see its commercial value as compared with similar unofficial remedies." That is just what we don't want to do. We go to the physician and try to show the physician that he has been used unconsciously as an agent to introduce a proprietary remedy. It is nothing more than a patent medicine and he is diplomatic enough to use the physician as the advance agent and get him to prescribe it, by giving out sample bottles with a label telling just what they want the laity to know, and the doctor has been unconsciously utilized as the advertising agent for a patent medicine.

Another thing: I think the words "U. S. P." should not appear on the label of any article for sale to the public; our official name should be strictly for professional use only. We don't want the names that we utilize to popularize these products to the public. We do not want to have the physicians have the experience that Mr. Diner can tell you about with antikamnia.

MR. BENFIELD: I would like to say regarding the names, a great many physicians take exception to the length of names in the official titles, and I would like to see some work done in adding to the names some abbreviation or contraction of the name so it

might be more easily remembered by the physician, because they are quite accustomed to names which are coined and therefore easily written and remembered. If we could adopt some name of that sort for our preparations, it would also facilitate the work of the physician.

MR. ELIEL: That is a point well taken. The physician very readily takes to a short or coined name, and my understanding was that this revision of the National Formulary would have these titles printed in that manner. That was a matter which came up in the August meeting of the Association at Kansas City, in 1906, and those of the members who are here now who attended that session in Kansas City will remember that this Section particularly voted in favor of brief titles. The matter was under discussion at the time, and I very well remember the remark made by the late Albert E. Ebert, and we were promised that convenient short titles would be introduced.

MR. MEISSNER: I would like to correct Mr. Eliel. There was no promise made at all of any such thing at Kansas City. There was a request made or motion made, which failed to carry, that names should be given to formulary preparations to take the place of some of the proprietary preparations; it was not thought by the Association at that time to be wise to place the American Pharmaceutical Association under the charge of making imitations of proprietary remedies. There was no motion made at the time there that such names be given and therefore no such promise could be made.

MR. MCELHENIE: Unless they were trademarked at Washington everybody would use them and they would belong to anybody and there would be as many different qualities of a given article as there were different manufacturers.

The American Pharmaceutical Association does not want any trademark. I do not see how they could shorten the names of most of them.

MR. HYNSON: I want to say, as the Chairman of this Section last year, that both Messrs. Meissner and Eliel are wrong, that the resolution did carry and they are both right. It did carry in this form, that as far as practicable coined names or short names should be used, but the Committee was left discretion in the matter, and after thoroughly going over it, I don't know of anything that Prof. Diehl gave more care and attention to, but he decided that only in an exceptional case could he do it at all and then not with a great deal of satisfaction; and I tell you I believe the physicians and pharmacists of this day and generation should learn to master these names sooner or later. I simply present that; I don't think we will get around to it in any other way, for if we do we will have the same plan. I want to say this suggestion was considered by the Committee, Mr. Meissner was on the committee and we did the best we could.

MR. MEISSNER: We were under instructions; we were instructed to stay about as far from the propaganda name as possible.

THE CHAIRMAN: I believe our time is about up for discussion on this subject, unless something more is to be said of importance; therefore I ask you to refer this paper, accept it or do something.

On motion of Mr. Meyer, duly seconded the paper was referred to the Publication Committee.

THE CHAIRMAN: We will proceed with the next paper. Mr. Kaemmerer has a paper on "More to Think About." I would like to have that paper presented at this time.

MR. KAEMMERER: This is the continuation of a paper read at the Indianapolis meeting.

MORE TO THINK ABOUT.

BY WILLIAM F. KAEMMERER, COLUMBUS, OHIO.

Being a continuation of the Paper, "Something to Think About," read at the Indianapolis Meeting.

The scarcity of drug clerks continues to be the great cry of the retail drug business. It seems not to be confined to any one locality—north, east, south and west—from cities large and small, we hear the same complaint. What are the causes of this scarcity?

Some would have it that it is due to the general prosperity of the country, and in order to relieve the situation would invite an industrial panic.

For my part, I do not believe that there exists any real scarcity of drug clerks. The situation is just this: There are plenty of drug clerks, and good ones, but they are not working from twelve to fifteen hours a day, and on Sundays and holidays, too. They have better jobs and are getting more pay for less hours of service than proprietors of retail drug stores are willing to offer. Some business and professional men place a higher value on the services of good men.

Another thing to be considered is that there are too many stores where drugs and medicines are sold.

The young man who engages as retail drug clerk after a few years, generally does one of two things: either he becomes disgusted and gets out of the business entirely; or he finds some way of starting a store of his own, and becomes a proprietor. Few remain as clerks because there is so little inducement offered in that capacity.

It is admitted also that the drug clerk and proprietors as a class have retrogressed. It could not very well be otherwise. Instead of getting the first pick of young men to enter our calling, we are now getting what is left over. Members of Boards of Pharmacy will also tell you that the classes which come up for examination from year to year are less promising than in former years. We are getting a class of young men who have drifted from one thing into another, generally failing in each, and are taking up the retail drug business as a last resort.

These young men are, as a rule, good and faithful workers, but can never be made to realize the duties and responsibilities which their position calls for. They can never partake of the true spirit of pharmacy and become real druggists. They lack foundation, they have not the education. They do, however, in a way, fill a certain want outside the prescription department. They should never be left alone in the store. Some of them do, after long years of service, cram enough into their heads to get an assistant certificate. Even these young men, after a time, become disgusted, realize they can go only so far, quit, and take up something else.

What we particularly need is a class of educated young men who can be made to grasp the details and responsibilities of the pharmacist and partake of the true spirit of pharmacy.

In our efforts to obtain this class of young men we find ourselves consid-

erably handicapped. This is what we confront him with : from twelve to fifteen hours a day work ; pay by the month instead of by the week, which makes a difference of about a month's salary in a year in favor of the employer ; work twenty-six Sundays in the year without pay, in other words, make the employer a free gift of his services on Sunday, although he makes good money out of it ; few holidays ; one week's vacation during the year with pay, rarely two weeks, and, in some cases, not any vacation ; salary, not any more than he can get at almost any other employment with half the effort. After about ten years of hard and faithful work, denying himself all pleasure, he will perhaps find a chance of going into business for himself. In another five or ten years of the same drudgery, by paying others by the month instead of by the week, making them work long hours and on Sunday, without pay, possibly, if he keeps in good health, he will find himself out of debt and in possession of a business which requires the most diligent and constant nursing. Often he can never get out of debt ; in which case, he is worse off than when he was as a clerk.

This picture is not overdrawn. It is just about what generally happens. Things would not be quite so bad if it were not for the excessively long hours and Sunday business.

Proprietors who pay their help by the month do so not because there is any justice in the practice, but I believe it is done because they can and because the clerks let them do it. The clerks are powerless to prevent it, they are unorganized. Things would be vastly different if they were properly organized.

Another injustice is overtime and Sunday work without any pay whatever. Other employees receive pay and a half for overtime, and if circumstances compel them to work on Sunday they receive double pay.

As a week's work is only six days, and a month's work is only twenty-six days, it matters not whether a clerk is paid by the week or by the month ; it follows that if he puts in any overtime and works on Sunday at all, he does so without pay. While on this subject of Sunday hours, I wish it understood that my objection to Sunday business is not on account of the remuneration, but on general principles. It is wrong for drug stores to be open on Sunday for the purpose of transacting a general business, and for profit. It is equally wrong for drug clerks to accept pay for Sunday work. Sunday business should be confined to absolute necessities, restricted to certain hours and the clerk should not receive pay for his services during those hours.

Laudable efforts are being made to get the right kind of young men into the retail drug business. We are trying to regulate requirements by law, so that only those who have completed one year of high school work can take up the study of pharmacy. Later on it is the intention to demand a completed course of high school work.

This of itself is never going to be successful. We cannot legislate these

young men into the retail drug business. We do, however, stand some chance of success if we can overcome some of the obstacles I have mentioned.

There are two ways in which this might be done: compel all other business and office men to work their help twelve or fifteen hours a day and on Sundays too, this would help to equalize matters; or, compel a shorter work day and some Sunday observance in the retail drug business.

The former is all out of the question. We could never force such an arrangement. The latter, I believe, can be brought about by the combined efforts of clerks and proprietors. In the first place the public needs to be educated as to the great injustice and the danger connected with the present system.

We must assert our independence. As long as we act the part of slaves, the public will insist upon the right to treat us as such.

Why do some drug stores open at 6 a. m.? Is it because some one might suffer for want of a dose of medicine, or for some other reason? Most generally you will find at that hour of the morning no one will be in charge who has a legal right to dispense a dose of medicine or fill a prescription. Drug stores do not open so early in the morning to fill prescriptions. The same remark will apply to drug stores which keep late hours at night.

Not long ago a physician prescribed, under the official title, in perfectly legible writing, one drachm of Dover's Powder to be divided into twelve powders. It was taken up town to three different stores which keep open after eleven p. m., and none of them could fill it; not because they did not have any Dover's Powder, but I believe, because they did not recognize it when prescribed under the official title. Those stores, undoubtedly, at that hour of the night, were being run by unregistered help contrary to law.

There is no call for these early morning and late closing hours. Likewise, there is no excuse for all night stores: oftener than otherwise they are conducted contrary to law.

When it comes to all night stores, is there any call for them? Did you ever visit one of these stores between midnight and 3 a. m.? Notice the class of people who hang around and what they buy. Try the experiment for about a week. It will be most instructive. The little good that these all-night stores does not begin to compensate for the harm which they do.

If it is your desire to corrupt the morals of a drug clerk, make him take the night shift at most any one of these stores for about six months. It will be safe to guarantee results.

Sunday business also carries with it the danger of employing unregistered help. There are many stores that on Sundays for periods of from two to six hours are without a registered man in sight. Sometimes they are conducted all day contrary to law. If sales on Sunday were confined to

supplying necessities, these could be taken care of in a few hours and there would be no violation of the pharmacy law. Likewise, during the week, if the hours were shortened, it could easily be arranged for the stores to be, at all hours, under proper supervision and at no time conducted contrary to law.

Give some proprietors a finger and they will immediately grab an arm. Grant them the privilege of occasionally leaving their stores in charge of unregistered help for a short time in order to attend to some necessary business and they will immediately take advantage of this leniency and make it a habit, often absenting themselves for several days at a time. Here lies the danger. A physician does not always prescribe specialties because of the representations made to him by some detail man nor because he lacks the proper knowledge to write a legitimate prescription. Often it is because he has become disgusted. He very probably, on several occasions, has written a very particular prescription which was later filled at a drug store during the proprietor's absence by some one who was not legally qualified, and with disappointing results. I know of several instances of this kind. This is also one of the reasons why some of our physicians dispense their own medicines, and this acts as a handicap to the U. S. P. and N. F. propaganda.

Some one has remarked that these are mere technical violations of the law. I deny that they are such. They are real, serious violations and attended with no little danger to the public.

I know also, that we have all kinds of whimsical laws so that we can scarcely do anything without violating some of them, but our Pharmacy laws cannot be placed in this class.

There are good druggists and good drug clerks who would like to know why they are not protected in their rights, and why they must compete with those who violate the law. As an excuse for the non-enforcement of the pharmacy law, it is said, that if these laws are strictly enforced it will end in their repeal or in their being declared unconstitutional. We have no fears on that score. The chances for that to have occurred have gone forever. Our pharmacy laws are here to stay, they will never be repealed nor will they ever be declared unconstitutional.

Why do we have pharmacy laws? Are they for the purpose of protecting the public or simply to quiet them and leave them in a position of false security? If they are not intended to be enforced, they are worse than no laws and are a detriment to good druggists and clerks.

I well remember before we had any pharmacy laws, in cities of about fifty thousand inhabitants, there were usually about a half dozen drug stores which had excellent reputations and which did the bulk of the drug business of the town. They were careful in what they dispensed and whom they employed. They had to be, they valued their reputation too highly to do otherwise. They didn't need any poison law, liquor law, pure food

and drug law, nor any anti-narcotic law. They could not afford to do anything that was not right. People knew that when they had a prescription filled at any one of these stores, they were safe. They also knew, that if they took their prescriptions to any of the other stores outside of this half dozen, they were running big chances.

Pharmacy laws have changed all this. All are alike according to the law and in the eyes of the public. The public believe that they are perfectly safe in having their prescriptions filled at any store displaying the sign of the mortar. It ought to be, but is it?

I have no quarrel to pick with members of boards of pharmacy. They are in no wise to blame for the existing conditions. Their acts merely reflect the wishes of the majority of proprietors who do not want these laws strictly enforced.

Coming back again to the Sunday question, the Sunday business, as now conducted, is unjust to other merchants who are compelled to close their places of business on that day. If the grocer, on a Sunday, sells a pound of sugar; the butcher, a beefsteak; the baker, a loaf of bread, or, if the drygoods merchant sells a towel or a cake of soap, they are liable to arrest, and in all probability, would be arrested.

Not so the proprietor of a retail drug store; he may sell anything and everything on Sunday and in any quantity, under the cloak of supplying the sick with needed medicines. He may even run special sales on Sunday and in some cases he does, and is never molested in the least.

Also, look at the tremendous advantage he has over other merchants. His clerks work for him on Sunday for nothing, and they work hard too; harder than they do any day during the week. They don't even ask for any pay for Sunday work, nor do they expect it.

The most unwelcome thing that you can bring into one of these stores that cater to Sunday business, is a prescription; especially if it requires some knowledge or special care; or if it is going to take some time to prepare. A prescription calling for a dozen suppositories for instance. They would be most likely to tell you, "sorry, but we're just out."

Why are prescriptions unwelcome on Sunday? Because they interfere with sales of soda water, cigars, candy and other articles which are more important. Sunday business is also objectionable on religious and moral grounds. It has a tendency to draw a man gradually away from church until finally he is out of its reach. This happens, not because he does not believe in it or hasn't been brought up better, but solely because he works on Sunday. The separation takes place gradually. At first he goes to church every second Sunday, then, at gradually lengthening intervals and finally he quits entirely. He gets to that point where he is afraid to be seen in church because of the notoriety the event would create. People would remark, "Why there is Mr.—— in church. I wonder what he is doing here? Something is going to happen." I know of drug clerks and

some proprietors who have not been inside of a church for six years ; not because they do not appreciate the value of the church, but as I have just pointed out, they have gradually drifted away. Put a man at work on Saturday, let him keep going as hard as he can from seven a. m. till eleven p. m. ; you will find that he will be pretty well fagged out. By the time he gets out of the barber shop it is Sunday morning. Let anyone go through this experience ; and when it comes along about church time, the bed begins to feel good. Especially so when he realizes that on the following Sunday he must hustle from seven a. m. to ten p. m. He feels that he needs the rest, and as a matter of fact, he does need it.

If it is necessary for other merchants and their clerks, who work only nine or ten hours per day during the week, to have Sunday to themselves, how much more necessary is it that druggists and their clerks, who work longer hours during the week, should have their Sunday to themselves ?

Not to belong to a church is dangerous. You should take an interest in the church not only for the good that it will do you, but for the good that you might do for others. It is so with every business or profession.

After all is over, a man's real value in this world is never measured by what he has done for himself alone, but by what he has done for others. So it is in pharmacy. A man's value to the cause of pharmacy is not measured by what he has done for himself but by what he has done for others. It is so with every business or profession.

To gain financial success and leave a trail of demoralizing influences behind is a crime. It is a crime which has been too often committed in the past and for which the present generation is paying dearly. The same crime is being committed to-day.

Excuse me for moralizing. I think that I may be pardoned for the offence because of a valuable little book that I carry. I am not referring to the Bible. I have owned a copy of the Bible a good many years. This little book which I refer to can be obtained from the Druggists' Liability Insurance Department of the Fidelity and Casualty Co., of 97 Cedar St., New York City, free of cost. It is an exceedingly valuable little book. I would advise all of you to secure a copy for yourselves and clerks. The title of the book is "Rules for Drug Clerks." They are taken from an article, written by Mr. J. B. Moore, of Philadelphia, and originally contributed to the March, 1905, number of the Druggists' Circular.

I would especially call your attention to rule three under the head of "Personal Conduct." It is as follows : "We do not desire to interfere with your religious principles and inclinations, but would say that good citizenship, respect for God and your own moral worth should induce you, by all means, to attend divine worship once on Sunday, or at some time during the week, as your time and convenience may permit. This will tend to confer upon you a better standing and will inspire public confidence and esteem."

The rules contained in this little book are all of them very good, just as good to-day as they were the day they were written.

Rule number three is just as important for proprietors as it is for clerks. I would say this in all seriousness.

It has been said that the hours of the retail drug business cannot be regulated because people cannot choose what hour to become ill, therefore it is necessary to open at six-thirty a. m. and keep open till eleven p. m. We might employ the same mode of reasoning and say that we must open at five a. m. or four-thirty a. m. Somebody might get sick. No, that is not the reason for these long hours and Sunday work.

The real, true reason is, as one writer has expressed it, because the fraternal spirit of good-will and help toward others has not developed strongly enough among druggists. As a consequence, each druggist has a very proper and natural fear of losing his trade should he close early during the week and part of the day on Sunday, and his neighbor not do likewise.

Why can't we learn a lesson from other merchants? They have their Sundays, their holidays, and a shorter work day. They are not losing any money by such an arrangement.

The best way to bring this whole question to a proper head is to insist on a strict and impartial enforcement of our pharmacy laws. Here is where a good live drug clerks' association could be of invaluable service. Not only could they bring about a strict enforcement of the pharmacy law, but other laws, affecting the retail drug trade as well. It would only require a half dozen determined drug clerks in each locality to do it.

Drug clerks know which stores habitually violate the pharmacy law, sell liquor by the drink, and which ones sell cocaine. They possess peculiar facilities for getting at the meat of these things. Whenever they gather together they exchange experiences, and these things are bound to crop out. No druggist who is trying to do the right thing would ever have cause to fear that he will be unjustly accused and prosecuted. Only those proprietors who habitually violate the laws need take alarm.

We are told that the business will not pay if we have a shorter work day and close part of the time on Sunday. Twenty or twenty-five years ago other merchants were confronted with this same proposition. They used to open early in the morning, close late at night during the week, and on Sunday they kept open till ten or eleven a. m. They, too, thought that they could never do business any other way. They don't do these things now and are making more money and giving better values to the public. You can never get them to go back to the old way of doing business. They have neater and cleaner stores and a better class of help.

One of the greatest mistakes ever made by the retail drug trade was when druggists refused to take up the shorter hour and Sunday closing movement at the time it was inaugurated by other merchants, and when drug clerks did not join the movement along with other clerks.

It is not too late to correct that mistake now, although it is going to prove difficult.

The barber trade can be cited as another instance where shorter hours and Sunday closing has worked an improvement. We have better and cleaner barber shops, better barbers who receive better pay. This, too, in spite of the thousands of safety razors that have been sold.

Shorter hours and Sunday closing will bring equally good results in the retail drug business. We will be able to get better help and pay them more money; we will have better and much cleaner stores; the prescription department and back room will be kept in a more sanitary condition, and the public will receive a much better if not quite such an abundant service.

In order to bring these changes about it is absolutely necessary for drug clerks to organize. They must organize in the same way that the salespeople employed in other stores have done. They must become a part of this great and powerful labor movement. If they organize on any other lines their efforts will end in certain failure. It will be nothing but talk and end in talk. Once get this great body of wage-earners interested, and these reforms will be successfully carried out.

I anticipate a storm of protest. We will be told that it is very unprofessional for drug clerks to join an association that is in any way connected with the labor movement, just as if drug clerks never performed any labor or worked for wages. It is against the ethics of the retail drug business. The ethics of the retail drug business—that sounds good. From an ethical standpoint, proprietors, dozens of times a week, compel us to do things compared to which, joining the local retail clerks' association is as gold.

By joining the labor movement we are lowering ourselves. When are we ever going to be released from the present slave conditions? After we get down still lower? We are down rather low now as it is.

Is it ethical for proprietors to belong to the National Association of Retail Druggists? I believe I saw it somewhere in cold black type that the N. A. R. D. was only doing for the great body of retail druggists what the labor unions were doing for the wage-earner—working for the benefit of the whole body as against the self-interests and greed of the few. If one is ethical so is the other. It is very wrong for the clerks to do these things, but if proprietors do the very same things they are all right.

There are drug clerks who would not join a retail clerks' association. They are way above other salespeople. To find out just how far you are above other salespeople you should join your local retail clerks' association and meet some of these other clerks, get acquainted with them. You will find that you are not made of any different clay. Most of them are making more money than you are, some of them very much more and working about three-fourths the hours you do. When a holiday comes, you generally have to work harder than ever, while they are out enjoying

themselves and getting something out of life. Most of them are married, have a nice family and are happy. Compare this with the \$2.50 a week bedroom or \$5 or \$6 a week boarding-house which many drug clerks put up with.

Most drug clerks remain single. They are afraid to get married—they can't afford it. A retail drug clerk, if he is single, can secure work easier than a married man. We very often see advertisements for drug clerks which close with "single man preferred."

Working longer hours for less money and on Sundays for nothing is not the most approved method of demonstrating one's superiority.

There are still other drug clerks who will say that they have shorter hours, and enjoy a good salary; "we are satisfied, let the other fellows look out for themselves." So also have most of the clerks who have volunteered in this movement. We, too, can sit down and shake hands with ourselves and tell the others to dig for themselves. Most of us can do much better than that. There is nothing to prevent us from having stores of our own. That we have not taken this step is not because favorable opportunities are wanting, nor is it because we lack the proper qualifications or ability. We also have brains and energy enough to make a living at something else if necessary: a thing that we have no intention of doing.

Most druggists and their clerks are opposed to the labor movement because they are not informed. The only information they have is that which they read in the black headlines of the newspapers. They see nothing of the other side of the question and fail utterly to recognize any good that has been brought about by the labor movement. This movement when analyzed, will be found to be nothing more nor less than a movement for justice. It is not so very far back but that I can remember my own father, after working all week on a brick wall under the hot sun, received as wages, not money, but grocery orders, shoe orders, and dry goods orders. If he wanted any ready money he had to sell these orders at a discount. He was skinned at both ends; first, by the man who was putting up the building and again, by the dealers on whom the orders were drawn. In those days it seemed to be the only proper way to treat the wage-earner. Things are different now. Do you know of any brick mason to-day who is receiving grocery orders or shoe orders as wages?

I do not claim that all the improved conditions enjoyed by wage earners to-day are entirely due to the labor movement; other influences have also been at work, not the least important influence is that which is due to church.

I am not prepared to defend all the acts committed in the name of organized labor, as I am but a recent convert to the cause and am not as thoroughly informed as I might be. In further defense I can only refer you to an article which appeared in the June, 1907, number of the "Rail-road Trainmen's Journal." If you will but read it, it will help clear the atmosphere.

I wish now to make just a few words of explanation. Throughout this article I have sometimes used the word "proprietor," and at other times the word "druggist." These two words when used in reference to the retail drug business are not synonymous. Not every one who displays a certificate from the Board of Pharmacy and has his name on a sign above the door is a druggist. It requires more than that to be a druggist—considerably more. I have laid bare some disagreeable features connected with our calling in order that they may be corrected.

I will admit also that my observations regarding the workings of the pharmacy law are confined entirely to Ohio. But, as Ohio was one of the very first states to enact a pharmacy law, and as nearly all pharmacy laws of the other states were modeled after the Ohio law, it is not too much to expect that they would operate similarly in other states.

My remarks have not been directed against any one individual or firm. They are intended for proprietors and clerks everywhere. I have no complaint against anyone who, in a business way, takes advantage of conditions as they exist in the retail drug business to-day. I would think he was a very poor business man if he did otherwise. If I were in business for myself I would in all probability feel myself compelled to do many of the things which I condemn.

I do, however, object to the system which makes these things possible. What we who have identified ourselves with this movement are endeavoring to do, is to break up this system. We hope, also, to put an end to the needless multiplication of drug-stores so that the position of drug clerk will be one of greater stability. How successful we will be depends entirely on the drug clerks. If they will properly support the movement, we will win out. If we fail it will not be because we have not tried. It will be too much to ask this Association to support this movement. All we ask is that you do not oppose our efforts.

Give us at least a chance to try.

In this connection, I received a newspaper a few days ago showing that the movement has started in at least one city; this paper is printed in Norwalk, Ohio. It is to be hoped that this movement inaugurated in Norwalk by the local pharmacists may be followed throughout the whole country.

Upon motion by Mr. Diner, duly seconded, the paper was referred to the Publication Committee.

THE CHAIRMAN: The Publication Committee has the power to do with it as they think proper.

MR. LOWE: General Hancock, when he was candidate for President, said that tariff was a local question. Well, I say as a Republican, it is quite possible that General Hancock was right because the tariff was looked at very differently in different parts of the country. This paper to-day has demonstrated that we can do very much more than we are doing. For years, when the proprietor of a drug-store, I closed every evening, I was

the only one, I was an oddity in the city in which I was carrying on business. I never run a soda water fountain and I don't want to make a slave of myself on Sundays, for that matter, I don't like to do it during the week. I think if we could take the soda water fountain out of the store, we could close a good many stores on Sunday, which now remain open on account of the calls for soda water. I said I was going to close on Sunday this summer for three months and I sent out a letter to my friends and neighbors stating that I was going to do that, that I didn't want to be the only pharmaceutical philanthropist, and one of my nearest neighbors saw it was working pretty well and he is now doing it. Possibly we may next year be joined by others. It is like the resumption of specie payment; we found the way to resume was, to resume. In the winter time I think it would be extremely difficult for us to do it, unless we called into service one or more men. We always have two men on one Sunday and two others the next.

MR. BENFIELD: In our town two weeks ago two druggists kept open on Sunday and were fined; they went before the squire, acknowledged that they had violated the law and were fined but the squire remitted the fine, and last Sunday there were four kept open. I kept closed because I believe in the law and that it should be enforced; but we don't want this man by the name of Sharp coming to us from Philadelphia and telling us how we should do business. They are getting after the railroads now and the coke works, the West End Railroad and other concerns and are enforcing the Sabbath observance, and that is all right.

THE CHAIRMAN: The next order of business is the report of the committee to gather statistics on co-operative buying and other subjects. I was under the impression that this matter had been disposed of by reference to the General Committee on Resolutions of the American Pharmaceutical Association, but upon receipt of the published volume of Proceedings for 1906, I noticed that it was referred to a new committee to be appointed by the Chairman of this Section. I immediately appointed the committee with instructions to report at this meeting. Mr. Mayo and Mr. Anderson are present, and I am going to call for a report of this committee, but before having them give a report I would like to say that this appointment came so late that the gentlemen have not had a fair chance.

REPORT OF THE COMMITTEE ON MUTUAL FIRE INSURANCE.

Owing to the fact that the Chairman of the Section on Commercial Pharmacy was not informed that it was his duty to appoint a committee on Mutual Fire Insurance until a very short time before the meeting, this Committee was not appointed until within a time so brief as to preclude the possibility of the preparation of anything like a full and adequate report on this most important subject. All that could be done was to collate some data on the subject which we have pleasure in presenting herewith, and to lay before you a few general conclusions drawn from a study of these data.

One who has not given the subject careful study will probably be surprised to find the immense sum involved in this matter of fire insurance, and still more surprised to learn how large a proportion of the business transacted is done by mutual or assessment companies. It is true that these companies are not provided for and cannot, therefore, legally, transact business in many of the States, but in some, as in Rhode Island, for instance, the volume of business transacted by the mutual companies reaches enormous proportions. In that State, during the year 1906, the forty-two mutual companies, twenty-two of which were Rhode Island corporations, either wrote or renewed a total of \$686,219,181 of risks, receiving therefor a premium amounting to \$5,467,861. The regular stock companies during the same period wrote risks amounting to \$156,878,838, receiving premiums amounting to \$1,425,153. It will thus be seen that in the State of

Rhode Island the mutual companies do nearly four times the amount of business done by the regular stock companies. In the State of Illinois the 212 mutual companies recognized by the State authorities in 1905 wrote a total of \$47,420,122. Unfortunately there is a lack of uniformity in the methods of classifying the several kinds of insurance companies and of tabulating the statistics based on the annual reports of these companies in the various State insurance reports. For this reason it is no easy task for a novice to extract just that material which would throw most light on one particular phase of the subject. The attitude of the authorities in the several States on the question of mutual and assessment insurance differs greatly, and we submit herewith a few excerpts from our correspondence with the insurance commissioners of several States on this particular phase of the subject.

From C. D. Goaslind, Commissioner of Insurance for the State of Idaho, we learn that: "In Idaho there are two fire insurance companies transacting business under a law providing for the organization of mutual co-operative fire insurance companies; one of these, the Idaho Mutual Co-operative Insurance Company, with headquarters at Boise, was organized in March, 1903; the other, the State Mutual Co-operative Insurance Company of Moscow, was organized in 1905. Both companies are conservatively managed, and have at this date no unpaid losses. The Idaho Mutual depends mostly upon assessments for the payment of its losses. The State Mutual charges a higher rate of premium, with the intention of avoiding, if possible, additional assessments. Inasmuch as the two above-mentioned companies can not write non-assessable policies, they must necessarily be very conservative in the acceptance of risks, limiting themselves to those of small liabilities, and consequently the growth of the company is greatly affected."

The Northwestern Mutual Fire Association of Seattle, Wash., was admitted under this Mutual Co-operative Law, but this company transacts its business in an entirely different manner. In the first place it guarantees a non-assessable policy, writing several different forms, viz.:

A semi-annual payment policy is written for a five-year term, and it charges on this class of policy board rate, collecting premiums semi-annually, and returning semi-annual dividends. The dividends paid on these policies have been 25 and 40 per cent., depending upon the particular class of the property governed; for instance, on risks written in their factory department the dividend was 30 per cent.; on risks written, brick building department the dividend is 40 per cent.; dividends on other policies issued on this plan 25 per cent.

On dwellings, barns, churches and school houses they issue three- and five-year cash premium policies and also five-year annual payment policies. They charge for annual payment policies on dwellings 60 per cent. of the annual board premium on such risks and return an annual dividend of 15 per cent. On three-year cash premium policies they charge $1\frac{1}{2}$ times the annual board premiums and are at present returning at expiration of policies a 15 per cent. dividend. On the five-year cash premium policies they charge $2\frac{1}{4}$ annual board premium and are returning on expiration of such policies a 15 per cent. dividend. They also charge with the first payment of these policies an inspection fee of \$1.50. We believe, that on certain classes of mercantile risks they issue a one-year cash premium policy, on which they charge 75 per cent. of the annual board premium, a policy fee of \$1.50 and a \$2.00 membership fee to parties who are not already interested in the association.

Mr. E. C. Cooper, Commissioner of Insurance for the state of North Dakota, writes that "the class of insurance to which you refer (co-operative) has not been carried on in this state for a sufficient length of time to put us in possession of any statistics that would be of value to you. We have some eight or nine mutual insurance companies operating in this state, but as I stated before, the time during which they have operated is so short that it has provided us with such meager statistics that they are practically

worthless. * * All of these companies charge practically the same rate as the old line companies, but some of them accept 60 per cent. of the amount of the premium in cash, and an assessable note for the balance or 40 per cent., which note is returned to the policy-holder at the end of the year as dividend, providing an assessment is not necessary. Others collect the whole premium in cash and return dividends in cash at end of year. These cash dividends run from ten to twenty per cent."

Mr. James R. Young, Insurance Commissioner for the state of North Carolina, writes: "There is no reason why a mutual or co-operative company should not operate successfully and to the advantage of its patrons if properly conducted. One great trouble about these companies is, that they endeavor to do business in the different states without complying with the laws thereof. This naturally puts them under the ban of the different authorities of the states and causes the people to suspect them of fraud and doubt their solvency. They claim to operate in this way as a matter of saving, but in the end it is a costly business.

There is no law governing co-operative insurance companies in Texas, and the commissioner says: "I am glad to say that there are very few of them in existence. This department looks with considerable disfavor upon any insurance company transacting business which cannot be officially supervised by this department. Therefore, we cannot offer any encouragement whatever as to the organization of a co-operative insurance company in this state."

This spirit of antagonism to mutual insurance manifested in the above letter is even more pronounced in the state of Mississippi, which state passed a law in 1902 expressly prohibiting assessment and mutual companies from doing business in the state.

The American Druggists' Fire Insurance Company, a discussion of which at the last meeting caused the appointment of this committee, is, according to the definitions generally accepted, not a mutual company, but is classed as a stock company. The condition of this company is shown in the attached report of the examination made by the State authorities of Ohio on July 2, 1907. Your committee felt it was hardly within their province to make any specific recommendations regarding this particular corporation, and beg leave to merely lay before the members the report of the State authorities referred to.

In the short space of time at our disposal we could do no more than give a general survey of the field, but that survey has interested us in the subject so much that the committee respectfully recommends that the Section on Commercial Interests provide for a standing Committee on Fire Insurance, whose duty it shall be to study every phase of the subject, reporting from year to year such recommendations as may tend to decrease the hazard on retail drug stocks and to lower the rate charged against stocks of this character.

A perusal of the admirable reports on fire insurance which have been presented during the past five years to the National Wholesale Druggists' Association offers many suggestions as to the direction in which such a committee might prove helpful to the retail trade by instructing it regarding the proper methods of securing low rates and guarding against fires. It should be a source of congratulation to our members to know that the report presented by one of our members, Thomas F. Main, as chairman of the Committee on Fire Insurance of the National Wholesale Druggists' Association for the year 1904, is regarded as a classic in committee work, and we commend its careful study to any committee which may be appointed by this Section in the future. If it is possible that any committee can do so great a service for the retail trade in this direction as was done for the wholesale trade by that particular committee, the Commercial Section will have amply demonstrated its reason for existence.

Your committee has not taken up at all the second paragraph of the resolution under which it was appointed, which called for information relating to buying clubs. In view

of the incomplete character of the report, due, as stated above, to the lack of time, your committee recommends that another committee be appointed promptly by the incoming chairman to carry on the work only begun by the present committee.

Respectfully submitted,

W. C. ANDERSON,
FRANK G. FREERICKS,
CASWELL A. MAYO, *Chairman*.

THE CHAIRMAN: You have heard the report of the Committee on Fire Insurance by Mr. Mayo. What is your pleasure in regard to it?

MR. GALLAGHER: I move that it be received and referred to the Publication Committee, and that the recommendations be adopted.

MR. MAIN: In rising to second this resolution I desire to say a few words. In the first place, this is a subject of not only very great importance, but one of very great interest. If any of you are interested in the subject of fire insurance you will find out what a great subject it is, and how much room there is for investigation.

In Mr. Mayo's report he commented upon the fact that there was a large business done by mutual insurance companies, particularly in the State of Massachusetts. That might be misleading if I were not to inform you that the immense amount of insurance written in Massachusetts by the mutuals, and in some other States is owing to the formation of mutual companies for the purpose of writing mill insurance. These companies are practically mutual companies only, and they will only write insurance on such mills, the buildings of which are built according to their specifications and plans, and which are fully equipped with fire-fighting apparatus. In relation to the admirable manner in which these companies look after their clients, I will state a fact that occurred in Paterson, New Jersey, a few years ago. You will probably remember that a large portion of that city was destroyed by fire, and also that it is a manufacturing city. The fire was advancing in the direction of other factories, but when it came to a point where a large factory building which was built in accordance with the specifications of the Massachusetts Mutual Fire Insurance Companies, and was equipped with the fire-fighting apparatus prescribed by those companies was standing, there it was stopped. When the general alarm of fire was sounded the hands of this mill went to their mill, and by the aid of other parties not only saved their mill, but prevented the fire from spreading in that direction. This is only one instance which shows the value of proper means of fighting fire, and it is promulgated by the insurance companies themselves.

Some attempt was made some years ago by the National Wholesale Druggists' Association to found a company for the placing of wholesale drug risks. It was a stock company and members of the wholesale trade were invited to take stock, and for a number of years they did business, but eventually it was wound up with a considerable loss to the stockholders.

I am not posted with regard to other trades, companies taking risks in particular trades, but I am informed that they have not been very successful. Insurance experts, underwriters believe that the fullest protection to all is insured by the dividing up of risks, that is, taking risk not on one trade only, but on a diversified number of trades, and in that way they are able to get better results for the protection of all.

On the subject of rates, as Mr. Mayo states the Manhattan Association, under the leadership of Dr. Alpers was able to secure quite a reduction in rates for the retail pharmacists in this city. A man looking at rates and seeing that a man in New York was getting a certain rate on his block and going to another city and being charged a different rate, might think he was unjustly discriminated against, but an investigation into the insurance matter shows that rates are governed by a great many things; one of the things

that enters into the making of rates in a city is the requirements of the building department as to the construction of buildings; the question of an adequate water supply is another, and also the question of a proper and well-equipped fire-fighting department. All these things enter into the making of rates, but I can conceive of no subject of greater interest to the members of this American Pharmaceutical Association than the following up of this matter of fire insurance and getting complete reports and statistics in relation to the rates charged in different States and informing the members as to the best methods of insuring protection against fire at the lowest possible rates for the risks under which their respective stores are situated.

MR. GALLAGHER: There is one part of the report of the Committee which stated that under the laws of various States mutual companies were not legal, could not transact business in that State. Now, I heard that sometime ago, but investigating the matter and laying it before a lawyer I was informed that a mutual company doing business had a perfect right, under the insurance laws of any of the States, to do business, that is simply a form of contract, one man with another that he agrees to pro rate the fire loss that may occur during the year, and it being a purely personal contract, no law can be passed to prevent them if they wish to. I find that is in the report and I find that it is a matter that I think the Committee ought to go into very thoroughly next year to find out whether it is so or not.

THE CHAIRMAN: It has been moved and seconded that this report of the committee be received and the recommendation be adopted. All those in favor will say aye; those opposed, no. The motion is carried, and it is so recorded.

Mr. Jas. I. Cowles, secretary of the Progress Postal League, read a paper on "Rural Free Mail Service of 1912," which was discussed by Messrs. Diner, Mayo, Gallagher and Hallberg, after which the following resolutions were offered by Mr. Mayo, and upon motion, duly seconded, adopted:

RESOLUTION AGAINST PARCELS POST LEGISLATION.

WHEREAS, The distribution of merchandise has become an important question to the people of the United States, as shown by the attention bestowed thereon by the Congress and also by the General Assembly of many States; and,

Whereas, The distribution of merchandise imposes many conditions on the different branches of trade which do not exist in the methods for transmission of communications or dissemination of news; therefore be it

Resolved, By the American Pharmaceutical Association that a distinction should be made between these two operations, and that legislation by the Congress should be directed to the readjustment of the laws, rules and regulations of the Postoffice Department so as to secure the greatest possible benefit to the people by improved service, limitation of the privileges of second-class matter so that it shall most strictly conform to the laws and regulations, so that the long-sought and long-ago-earned reduction of the letter postage to 1 cent per ounce may soon be established; and,

Whereas, Certain corporations now enjoy privileges because of their gigantic operations not available to ordinary dealers, and depend on the extension of these special privileges to still further encroach on the established methods of trade; therefore be it

Resolved, That the State Pharmaceutical Associations and all local branches of the American Pharmaceutical Association, and all members of this Association individually, and all retail and wholesale druggists, direct the attention of the Senators of their respective States and their representatives in Congress to protect the people from further encroachment of the legitimate functions of the Postoffice Department by opposing with

all their power the so-called parcels post legislation, because such encroachment would be of no real benefit to the people at large, and would simply aid in extending the business of gigantic corporations, to the detriment of the great army of retail distributors of merchandise, constituting about one-fifth of the entire population of our country: and be it further

Resolved, That the Congress enact such further legislation as may be required to prohibit special privileges, rebates, etc., by the common carriers and express companies; and further

Resolved, That the rules to be adopted by the departments of the federal government for the interpretation and enforcement of the Pure Food and Drugs Law be so construed as to require all drugs sent through the mails strictly to conform to the letter and spirit of the law.

THE CHAIRMAN: We will now have the report of the Committee on Resolutions to whom was referred the Chairman's address and such other papers that have been referred.

REPORT OF COMMITTEE ON RESOLUTIONS.

Your Committee on Resolutions and Chairman's Address, beg to submit the following:

The point of discriminating rates on insurance is well taken, and agitation on this line should be continued.

This committee recommends that this Section request the appointment of a committee of three on Parcels Post whose duty it shall be to immediately commence an active campaign against any legislation of this kind.

Whereas it has been decided during the year that the organization of smaller interests for protection against conditions that demoralize trade is unlawful, under the Sherman Anti-trust Act. Be it resolved that the Commercial Section expresses the opinion that such construction of the said Act is contrary to its spirit, unfortunate for individual members of this Association and without benefit to the people at large.

That this Section hereby requests the parent Association to instruct its officers and Council to take such action as will secure an amendment of the said Act, permitting the union of small tradesmen for mutual protection.

FRANK H. CARTER, *Chairman*,
A. V. PEASE,
FRANK H. FREERICKS.

Upon motion by Mr. Diner, the report was adopted.

THE CHAIRMAN: Are there any further reports of Committees, if not, the election of officers will be in order.

Mr. Diner has been nominated as Chairman of this Section for the coming year.

Upon motion by Mr. Berger, seconded by Mr. Hynson, the nominations were closed and the chairman instructed to cast the vote of the Section for Mr. Diner.

THE CHAIRMAN: I take great pleasure in casting the affirmative vote of this Section for Mr. Diner as Chairman for the ensuing year.

MR. DINER: Ladies and Gentlemen: This is really an unexpected honor, and were it not for the courtesy of my good friend, Dr. Hynson, I feel that the honor would not have come to me. I was informed that the honor awaited me, but I have hesitated very much as to whether I should accept it or not; not for the reason that I am not willing

to work for this Association, but for the reason that I know you have far abler men in this Section, and that this Section of commercial interests is destined to be one of the most important Sections, if not the most important Section of the further proceedings of the American Pharmaceutical Association. I accept it, however, and I assure you that I will do the best I know to advance the interests of the Section. In doing this, however, I must appeal to you gentlemen for your co-operation and support. An association is just as strong or just as weak as the members belonging to it make it; a Chairman, no matter how hard he tries, can do nothing without the assistance of the members. So as you leave here at the close of this session, I want each and every one of you to go away with the determination to write a contribution on some subject which you think will be of interest to the Association, and which I know will be of interest to the Association, because, as I look around, I do not see a single man present who cannot do some good for the Association and to pharmacy at large. I thank you very much.

THE CHAIRMAN: The next in order will be the election of the Secretary. Mr. D. O. Young was nominated.

Upon motion, duly seconded, the nominations were closed and the Secretary directed to cast the affirmative vote of the Section for Mr. Young.

THE SECRETARY: I have great pleasure in casting the vote of this Section for Mr. Young as Secretary for the ensuing year.

THE CHAIRMAN: By your vote I declare him legally elected. There are three Associates—Messrs. Pease, Benfield and Carter have been nominated. What is your pleasure?

MR. MAYO: I move that the Secretary cast one affirmative ballot to elect all three. (Seconded.)

THE CHAIRMAN: It has been moved and seconded that the Secretary cast an affirmative vote for each of the three to be elected to office and that have been nominated. All in favor of the question let it be known by saying aye; contrary no; the motion is carried.

THE SECRETARY: I cast a ballot for Messrs. Pease, Benfield and Carter as First, Second and Third Associate in the order named.

THE CHAIRMAN: By your vote I declare them elected. We should like to have a few words from the Secretary-elect.

MR. YOUNG: In view of the fact that I have so recently become a member of the Association, I certainly feel complimented by the honor you have conferred upon me, and I shall endeavor to fill the office to the best of my ability.

THE CHAIRMAN: A great deal depends upon the Chairman and the Secretary, and I take it for granted without calling upon the others for a speech that they will enter heartily into the work and do the best they can. However, if they have any remarks to make, we shall be glad to hear from them.

We have two papers. Has any one present a paper for this Section that has not been called for? We have two on the table; they are not lengthy, What is your pleasure?

MR. WILBERT: I move you that they be read by title and submitted to the Committee on Publication. (Seconded.)

THE CHAIRMAN: One paper is "To Prevent Store Loafing, by J. B. Moore, of Philadelphia.

The other one is "The Cocoa Bean Situation in the Summer of 1907 from the Commercial Standpoint," by A. M. Hance, of Philadelphia.

THE CHAIRMAN: It has been moved and seconded that these papers be referred to the Publication Committee. As many as are in favor of this motion will let it be known by saying aye; contrary no; the ayes have it and the two communications are referred to the Publication Committee.

Before retiring I desire to thank the members of this Section for the honor they have conferred upon me during the past two years. I feel that I have not done for the Section the amount of work that I really might have been able to do but for the immense amount of responsibilities I have had during the past year. I have been Secretary of the Board of Pharmacy, and Secretary of the State Association, and have had a great deal of work to do; besides, I was a member of the Committee to draft the Constitution for the proposed State Association for the new state of Oklahoma, which we hope soon may be brought into the association. All these duties during the past year have prevented me from doing as much as I otherwise would have done. I thank you. We will now have the installation performed in the usual manner. I will ask Mr. Hynson and Mr. Meissner to escort the newly elected officers to their chairs, beginning with the chairman.

The committee performed the duty assigned them and Messrs. Diner, Young, Pease, Benfield and Carter were promptly installed in the offices to which they had been respectively elected.

CHAIRMAN DINER: Before we proceed to adjourn, I would like to say a few words in regard to the work mapped out for the next year. It is the custom, as you know, for the Chairman and Secretary (a good Chairman always lets the Secretary do it; of course that is the way I expect to do it, for I know I have a good Secretary to do the work)—it is customary to send out letters asking for papers. If you will permit me to select a few subjects on which papers might be written for the Association this coming year, I would suggest for your consideration the following subjects:

1. Does the Public Telephone Benefit a Drug Store?
2. Do the postoffice sub-station, sales of stamps, city directory, and all other accommodations now offered to the public benefit the druggist; and if not, how can they be made to do so?
3. The commercial value of taking your clerks into your confidence.
4. Does the present scale of remuneration bring into our fold the necessary number and right kind of clerks; and if not, how can that be remedied.
5. The value of the window and the kind of goods to display therein.
6. The trade in supplies and the druggists' share in this trade.
7. Are the druggist's own preparations of real profit to him, and what kind of remedies should he select?
8. The confidence of the public as a valuable asset, and how to gain it.
9. The advantages and benefits of national co-operation of retail druggists.

I believe these subjects offer a great deal of food for thought and discussion, and I have no doubt that members will have a great many more questions along similar lines. I have believed that the Section on Commercial Interests should fill a very prominent part in advancing the practical side of pharmacy, which represents commercial interest, and I hope and trust we will have a number of papers, perhaps a number on the same subject, viewing the subject from the different points of view, so that this may be of real interest in the forthcoming meeting in Arkansas next year.

MR. GABLE: I rise to move that a vote of thanks of the Section be tendered to the retiring chairman and his associates. (Seconded.)

CHAIRMAN DINER: I certainly rise with great pleasure to put this motion, and I have not any doubt that everybody in this room feels that we owe a great deal to Mr. Kniseley for the very interesting sessions and for the amount of work that has been necessary to make this Section interesting. I ask you ladies and gentlemen to rise in token of your appreciation of the work done by Mr. Kniseley and his associates. (Rising vote.)

Any further business to come before us before we adjourn? If not, I will entertain a motion to adjourn.

Upon motion, duly seconded, the Section then adjourned to meet at Hot Springs, Ark., in 1908.

Papers read by title:

THE COCOA BEAN SITUATION IN THE SUMMER OF 1907 FROM A
COMMERCIAL STANDPOINT.

BY A. M. HANCE, PHILADELPHIA, PA.

Cocoa Crop Failure.

"The report of the British colonial secretary at Grenada for the year 1905 states that there was an unexpected collapse of the cocoa crop in that year, both as regards quantity and prices. It fell short about 3,000 bags from the crop of the previous year, but the crop for the current year has been seriously curtailed, and the shortage at the end of August, even as compared with last year's short crop, was 9,800 bags. The cocoa crop of the colony for 1905 amounted to 94,300 bags, from which there is a falling off of 10,000 bags for the present year. Cocoa forms 85 per cent. of the island's exports."

"No doubt, the failure of the cocoa bean crop this year is chiefly responsible for the rise in values, and this condition has been aggravated by the rapidly increasing use of cocoa by confectioners and others. Bean prices are high, and the consequence is that spot stocks of cocoa butter are very low, and prices are advancing."--*O., P. and D. Rep.*, Dec., 1906.

Since the above news items appeared last December, there have been continued advances in the prices of cocoa beans and products: and as the subject is of some importance to the drug trade, the writer has ventured to touch on it along the lines indicated in the title.

Some twenty years ago the writer had occasion to look up a subject that at the time seemed entirely foreign to the pharmaceutical manufacturing business, viz., the several products of cocoa bean.

While the interesting story of cocoa (and vanilla) has frequently been told, a brief review may not seem out of place here.

Cocoa, or more properly speaking cacao, was brought to Spain in the year 1519 by Fernando Cortes, who found it a staple beverage in Mexico (in the "New World") among the Aztecs. Their method of preparation was a peculiar one,* but another indigenous plant, the vanilla bean, was used by them in the process by reason of its flavoring properties. That

* See Prescott's "Conquest of Mexico."

this was a happy combination ages ago is proven by their almost universal use and popularity to-day ; and the old Aztec name for this—"Chocolatl"—is used daily in almost its original form, phonetically, in the great English, German and French languages.

The cocoa tree (natural order *Sterculiaceæ*) is indigenous to tropical America, and flourishes in a warm, moist climate in sheltered valleys where the soil is soft and rich and damp, in a zone about 25° north and south of the equator, though it is said to thrive better if confined to a belt 15° north and south.

The culture of cocoa requires constant care. The seed germinates in two weeks after planting, but flowers are not produced until three to five years after. The tree is most prolific when it is from twelve to thirty years old, though it may bear for fifty years or so. It yields an average of three pounds commercial beans per annum, and while bearing at all seasons the principal crops are garnered in June and December.

As cocoa has a greater food value than either tea or coffee, it more than held its own in Spain, Portugal and France, Thus the use of chocolate as a confection and beverage continued, we must assume, for several centuries without much variation ; but from Spain it gradually spread through Europe, being introduced in France by Queen Maria Theresa, consort of Louis XIV.*

The French presumably took more kindly to chocolate than the Spaniards, and among their other more diversified industries, chocolate began to be manufactured on an increasingly large scale ; the heavy machinery necessary being moved by water power before the invention of the steam-engine. For another half century or so, the business was mostly in the hands of the French, and as their commerce extended to foreign markets, it gradually attracted the attention of capital in other countries. In 1893, there were exhibits at the World's Fair, Chicago, not only of the products of large manufacturers of chocolate from France, Germany, England, Switzerland, Belgium, Holland and the United States, but also fine exhibits of ponderous and complicated machinery for the manufacture of chocolate, by German, French, English and American firms. Chocolate and the machinery for manufacturing it are interesting subjects, but it is not within the province of this article to touch on them, other than by allusion.

Up to the time of the Columbian Exposition there had never been such a collection on exhibition, for indeed at the Centennial Exhibition in Philadelphia (1876) there were only a few such foreign exhibits. I simply mention this, however, as indicating the wonderful growth of the business in recent years, say since 1876, as that makes it about an even third of a

* See "Manual Pratique des Cultures Exotiques, par P. H. F. Bourgoïn D'Orli. Paris, 1885."

century ; that is, from an article little known in this country and then made by probably not more than eighteen or twenty manufacturers* large and small, to the distinctly visible proportions of seventeen years later (to 1893) and the enormous growth of the business in the fourteen years since then (to 1907).†

There are doubtless many factors that have contributed to this growth in consumption and advance in prices of the beans that the writer has not heard of or thought of, but he attributes it mainly to three causes :

1. The low price at which the beans were sold in the past.
2. The universal fondness for chocolate and sugar (for sugar enters largely into the preparation of chocolate both as a confection and as a beverage) really increasing faster than the world's population.
3. The federal Pure Food and Drugs Law which went into effect January 1, 1907.

Indeed, almost every month it seems more apparent that this latter factor, as to prices, is the most important one in this country, notwithstanding the question, "What is pure chocolate?" is really undetermined at this writing.

As the manufacture of chocolate became better understood and the confectionery business grew apace, it was found possible to separate the fixed oil or cocoa butter from the mother chocolate, mechanically, by powerfully constructed hydraulic presses. It was at about this time that the writer began his investigations to find a perfectly pure chocolate and cocoa butter for pharmaceutical purposes, such as the use of cocoa butter in suppositories, ointments and cosmetics, and of chocolate for coating compressed tablets, pills, etc., as a vehicle for disguising the taste of nauseous and bitter drugs, as a dietetic ; also to supply an article for druggists' use at the soda fountains, because there seemed to be a large field open in this direction. (I might say in passing that in this the writer was not mistaken, for it is generally understood that chocolate has become the most popular flavor to-day, from being comparatively unknown as a soda-water flavor twenty-five years ago.)

The outcome of this investigation was the installation of a suitable plant, thus enabling one to purchase cocoa beans in the open market, and by going right to the "fountain head" it was possible to absolutely eliminate all risk of adulterations in any purchase of this class of goods for the above-mentioned purposes.

* The 1907 directories give a total of 185 manufacturers of chocolate and cocoa; and this in the United States only!

† This must not be construed as any attempt to underrate the Centennial Exhibition, as it was the most successful one ever held in this country up to 1876, and none held since then have approached it in general interest and educational value. The facts as to chocolate machinery exhibits are only adduced to prove the writers claims to the growth of the business in the interim named.

As I before stated, with the advent of special machinery, cocoa butter became the main product of chocolate manufacturers to mix in the mother chocolate and sugar in the manufacture of chocolate coatings for confectioners' use. Then began the manufacture of many other kinds of confectionery, of which probably one-half consists of chocolate, until to-day it is done on such an enormous scale, especially in this country, that more cocoa butter is continually being required for this purpose. On account of the proverbial American "sweet tooth" * a much greater impetus has been given the business since the invention and introduction of special machinery for coating chocolates, which formerly was a most laborious hand process, and required very skillful and rapid operators. This has all been done away with now in this country in the larger plants, and the consequence is that cocoa butter has become the main issue and the remaining chocolate partly a side issue. This latter being in the shape of hard cakes must be reduced to a powder to make it marketable, and here comes in the danger of inferior chocolate, for the domestic product is largely manufactured from cocoa beans that are bought, not on account of their flavor, as are demanded by manufacturers of high-grade chocolates, but for the cocoa butter, which is the principal cause of such beans having a market value at all.

Abroad, on account of the beans generally used being of a better flavor, the French, Germans, Dutch, and more recently the English people, have become great cocoa drinkers. But here, whether on account of the cocoa generally being of a poorer flavor or not, our people as yet have not taken to it; or probably because the coffee and tea habits are too well established and the imitation coffee fat has not run its day; or it may be that Americans, in their usually extravagant fashion, have taken to eating chocolate and prefer it in this form rather than as a beverage, though the latter is a much more economical way to use it; or because of their great fondness for milk chocolates, a business which in itself has grown to enormous proportion in the past few years.

The best evidence of the increasing popularity of cocoa products in the United States is given in the following astonishing figures as to importations of the raw beans since 1880:

<i>Year.</i>	<i>Pounds.</i>
1880	7,403,643
1885	10,300,120
1890	18,266,177
1895	29,307,048
1900	41,746,872
1901	45,924,353
1902	51,379,369
1903	63,351,294
1904	84,772,176
1905	100,000,000

* Philadelphia is universally regarded as the largest manufacturing city in the United States, but very few people know that its leading industry is the refining of sugar, which by the census of 1905 amounted to \$37,000,000 per annum.

From this it appears that up to about 1902 the increase in importation was in an arithmetical progression, but since then the demand has increased so as to draw more beans to this country, and the consumption seems to be increasing in a geometrical progression, though of course this could not continue indefinitely. As the beans are not an annual crop at the start, like corn, wheat, hay, cotton, etc., but a matter of ten to fifteen years' careful nurturing of the trees before the crop is marketable, only one thing can happen, viz. : the increase in price of the raw product in proportion to its increasing scarcity ; that is, until such a time as the demand for cocoa products might fall off, or the cocoa bean market become overstocked again.

The price of beans has been steadily advancing until to-day they are 90 per cent. higher than they were twenty-five years ago. This advance has apparently not been especially noted by American manufacturers of confectionary, many thinking the advance only temporary, but as it has been estimated that this means about \$6,000,000.00 more per annum that their goods cost than a few years ago, they must eventually advance their prices, for nothing can be used under the new Federal law in place of chocolate, and there is nothing else to legitimately take the place of cocoa butter.

It is not generally known that in England—a so-called free trade country—there is just enough duty on manufacturers of cocoa beans to keep out the goods of French, German, Swiss and Dutch manufacturers, across the English Channel. This is not prohibitive if the English people care to buy foreign makes, as many of them do ; but it was undoubtedly the beginning of the popularity of cocoa as a beverage in England and also largely caused by English advertising ; because it paid to advertise distinctive brands, giving the masses a healthful and nutritious beverage for a comparatively small sum (1 penny) a cup and quite within their means.

While our last tariff placed a duty on manufacturers of cocoa beans, an iniquitous system of under-valuations made the tariff almost nugatory, until about ten years ago, the manufacturers collectively protested and the clique employed by foreign interests was broken up. Almost from this time the business here began to increase without working any hardship on the people in the way of increased prices ; rather the reverse because the invention of new kinds of machinery has enabled manufacturers to put out their goods at prices which bring them within the range of the pennies, and nickels and dimes of the masses. But all this was when cocoa beans were low in price ; too low. Years ago they were higher and the business of cultivation was profitable ; then came about the condition of great crops, new plantations started in Java, Ceylon, Africa, Martinique, San Domingo, etc., until the supply was greater than the demand ; then the low prices of beans and the knowledge of large productive plantations through the tropics attracted the attention of manufacturers, until now we see the

pendulum swing the other way, and no one can foretell the future—except that the growing of beans will be taken up in new countries favorable to their development and, as near as planters can foretell, free from political strife and civil wars.

Had the Dutch, and some other colonists not shown the foresight they did a generation ago, there is no telling where the business would be to-day; for the millions of pounds of cocoa beans coming to the markets while they kept the prices down for awhile, are now becoming a source of revenue to their farsighted growers.

It has been said that the conditions as we have seen them are the result of cornering the market, but this is not so, either in respect to cocoa beans or cocoa butter, the great markets for which are London and Amsterdam; both products are too perishable to hoard like gold or even wheat. It is simply the working of the universal law of supply and demand. In the writer's opinion the demand will continue to increase and until the supply can catch up to it, prices of the finished products will gradually advance too.

TO PREVENT STORE LOAFING.

BY J. B. MOORE, PHILADELPHIA, PA.

"Notice."

"Pharmacy is a business which differs from almost all others. The drug store is where ladies, modest and sensitive maidens and children and others have to come and make long waits for prescriptions and other medicines to be prepared, and they feel embarrassed and mortified to sit in a store where there are a number of gentlemen idly sitting around, no matter how respectable the latter may be. Consequently this is likely to prove a great detriment to the business, as it will tend to keep away many of our best customers. We hope, therefore, that our gentlemen friends will think of this when making social calls. When our motive for this friendly notice is once understood we are sure our *friends* will not take offense, but will coincide with our views and appreciate our desire to conserve our interests."

"Remember, we don't intend this notice to bar our friends from making us short calls as often as they desire. We will only be too glad to see them."

A notice of this kind would be the most effectual, impersonal and in-offensive means that could be adopted to prevent and permanently break up drug-store loafing. If it be attempted by verbal orders or hints, no matter how delicately or adroitly given, one is sure to offend and make enemies, as it is too personal. Besides, the effect of that method is too transient. When the druggist gets rid of one group in this way, another crop, which is not aware of the rule, will appear upon the scene and he will be kept continually busy serving unpleasant personal notices. But a well-written and tastefully gotten-up card sign, which should be nicely and attractively framed and placed in a conspicuous position in the store, would serve as a permanent notice not only upon the *old customers*, but also upon *all new comers*. And if after a while some customers would seem to consider the old notice obsolete, or to have forgotten it, and have the temerity

to violate it, it would be well then to put up another, but smaller sign, where it could be seen by everybody, with the following or similar words:

"We regret to find that some of our customers have not observed our store notice, or have thoughtlessly disregarded its injunctions."

Many of these people never think of the injury that their long continued presence in groups in your store has produced, or they would without notice have stopped it. And those who would persist in doing it when they are aware of the wrong they are doing you are *not true friends*, so you need not care a fig whether you offend them or not. Besides, as these loafers are not in proportion of more than one in fifty, or one in one hundred of your customers, would it not be better for you to offend and get rid of the entire crowd than to offend a large number of your most respectable and profitable customers?

No man, however, in any business, need ever fear the boomerang of the announcement of any rule that is just and reasonable, and that is calculated to promote proper and judicious methods of business, and especially all such rules as tend to give his store tone, high character, and make it popular, inviting and attractive to ladies and the refined classes of the community.

The above is partly extracted from an article by me in "The Western Druggist," March, 1904, page 157.

Many pharmacists, I have no doubt, will think that the wording of this notice is too long, but this is a *great mistake*. I can assure my readers that there would not be a person, guilty of the offence referred to, who would not *carefully* and *thoughtfully* read every word of it, and, if it were twice as long, they would read the *whole* of it with *interest*. You must remember that people generally read everything that *interests* them, and as to those who are not interested, you need not care whether they read the notice or not.

MINUTES

OF THE

SECTION ON HISTORICAL PHARMACY.

FRIDAY MORNING, SEPTEMBER 6, 1907.

The Section on Historical Pharmacy was convened in the "College Room" of the Hotel Astor at 10:15 a. m., and was called to order by Secretary Eugene G. Eberle, of Texas, who presided over the session in order to relieve the Chairman, Mr. Ewen McIntyre, of New York, who was also present. The Historian of the Section, Mr. Edward Kremers, of Wisconsin, was unavoidably kept away from the meeting.

The Secretary stated that the first order of business would be the Chairman's Address, and Mr. McIntyre read his address as follows :

Fellow-Members Ladies and Gentlemen : As Chairman of this Section, it is my duty and privilege to call you to order, and I now extend to you all a cordial greeting.

An extract from "Moody's Magazine" may interest some, although it may not be on pharmacy, but as you are here in New York City something historical may be permitted or allowed. Within a decade, real estate in this city is to-day valued at more than one-twentieth of the entire wealth of the United States. It is 25 per cent. more than the entire wealth of Holland, Spain, Sweden and Norway, 50 per cent. more than Switzerland, Denmark or Portugal, it is one-third that of Italy, one-fourth that of Austria-Hungary, one-fifth that of Russia, one-seventh that of Germany, one-eighth that of France, one-tenth that of Great Britain and Ireland. The amount as stated reaches the enormous figure of \$5,800,000,000, 400,000,000 over 1906, and in turn shows an increase of 480,000,000 over 1905.

To this city, honored by your presence for the second time, I extend to all a hearty greeting. Forty years have passed since the first gathering. How few are left that were present then to note the remarkable changes that have taken place since, and who of us now present forty years hence shall remain or can fortell the changes that will take place in another forty years; marvelous changes, not only in this city and land, but necessarily in our Association, this to me as I stand here is but an indication of the great responsibility resting upon each one of us to do the utmost, our best to make the most of our opportunity, for upon each rests the responsibility to continue the good work done by those who have passed from our midst. We are to be congratulated by the work so well done by the able men, our predecessors, and we can all earnestly hope it will be continued, and even greater progress be made.

To-day we all regret and miss the presence of the first Chairman of this Section, one who so unselfishly and continually labored, not only for this Section, but as well and always for the best interests of the society. To A. E. Ebert we owe much, and we all feel greatly the loss of his presence with us to-day.

The address of the able chairman of the section last year (Mr. Hancock), who should now be chairman, clearly defined my duties greatly relieving me and as well sparing you the infliction of a long address, viz., to make the chairman's address as brief as possible etc.

The secretary will report the funds received and expended and all other items connected with his office.

The historian will make his report on the work of the year.

Recommendations for the ensuing year:

1. I would recommend the nomination and election of a younger and capable man as chairman for the section.

2. That every member of this Association take a real live practical interest in the object and aims of this Section, by personal effort and suggestions as to members of the Association, Pharmacy, its intents, its history, its interests or any matter they may deem of interest, by correspondence with the Chairman or his associates. By this means much of interest could be gleaned and preserved by the section.

The Secretary called for action upon the address of the Chairman, and on motion of Mr. Scoville, seconded by Mr. Hancock, the paper was ordered received and referred for publication.

The Secretary then read his own report :

REPORT OF THE SECRETARY OF THE HISTORICAL SECTION.

The Secretary hesitates to offer an excuse rather than a report, but the precedent set in previous sessions together with the vote of the Section on the respective duties of the Chairman and Secretary, which resulted in limiting these to a merely executive and advisory capacity, have deterred him from being too bold in assuming proscribed privileges.

It is well to go slow in transmitting authority, but I believe the time will come when it will materially advance the interests of this Section to charge the Chairman and Secretary with the usual functions of such officers in other Sections. The proper selection of officers who will labor in harmony with the historian will obviate any possible disadvantage. The work of this Section branches out in many directions, but the purpose should be continuously kept in mind so that the history made by our predecessors and of our contemporaries may be brought into convenient form and that the greatest benefit may be derived by us and our successors. Far be it from me to suggest that the Section should not give pre-eminence to the historian, and I am more than ever impressed that his office should be a permanent one, or, perhaps, better, the present incumbent should hold it so long as convenience will permit. The year is too far distant to speak of who shall be next, but in the very nature of things, the success of this work depends upon such permanent officer. The Historian should each year outline the special work to be followed by the Chairman and Secretary. The latter officers can, in order to fill in, interest some with subjects they are qualified by information or association to submit. The suggestion will be understood to refer to individuals or institutions, and the occasion of important events in their history. The officers annually elected may lose sight of the objective; the Historian, being familiar, will direct. As heretofore stated, we divert in this Section, and perhaps for a season neglect adding to the chains we are linking, the next year we add to, so that by keeping in mind the work begun, we present such a

variety of interesting subjects that every one can contribute who will aid in making these historical data useful because of their completeness.

Last fall the Secretary sent out addressed (and in most cases, if not all), stamped, return envelopes to Boards of Pharmacy, State Associations and Schools of Pharmacy containing blanks requesting information bearing upon related subjects. Quite a number of returns were received. These have been bound, and are herewith presented. Much of the information is valuable, though some is already in possession of the Section. It was hoped that more would be said of the bodies appealed to and of the individuals who had contributed their labors to the cause of pharmacy. The "Druggists' Circular" collected similar data and achieved better results; these were published in their memorial number, issued January of this year. In view of that fact a bound copy was requested for this Section, with the hope that it would be gratefully accepted. Taking these two sources into consideration, the results speak fairly well, especially as the circular letters procured for the Historian, complete records from some of the bodies addressed. Appeals for contributions and papers were freely made by the usual methods. With proper solicitation all journals might be induced to present as complete files of their publications as possible. Their value to the Section is great, for they contain the records of events we aim to collect.

We desire to thank those who aided us.

The program prepared for the Session is before you.

Sincerely,

E. G. EBERLE,
Secretary Historical Section.

On motion of Mr. Hancock, the report of the Secretary was accepted.

In the absence of Mr. Kremers, the Secretary read the report of the Historian, by request of that officer :

REPORT OF HISTORIAN.

That the historical work of the Association has not been at a standstill since the Indianapolis meeting last September becomes apparent from the contributions received since then. Herewith is offered a list of the contributions received.

The number of miscellaneous documents received within the last year or two has been so great that it has been impossible for the Historian to properly mount and classify them. While he has done a fair amount of work of this sort since 1902, it had to be done when he was too fatigued to do other more serious work. Yet it should be done and done regularly. The time seems to have arrived when the Association might well allow a small sum for clerical help for work of this sort. Such an allowance should not be made to the Historical Section for current expenses, but it should be definitely stated that it is for clerical assistance for the Historian.

Your Historian has had the good fortune very recently to interest an ex-pharmacist from Indiana now residing in Madison in this work. While he has expressed his willingness to do some of this work as a labor of love, the Association should not accept such services for any length of time without offering some remuneration. I trust, therefore, that this Section may recommend to the general session the appropriation of a small allowance for clerical aid.

The Historian's work should be more systematic than that of a clerical assistant. During the past year he has made a special effort to systematize the materials that had accumulated on the subject of pharmaceutical education.

Whenever opportunity offered, he has written to persons suggesting to them the feasibility of writing up certain subjects historically in which they appeared to be specially

interested at that time. As in previous years, several of the papers to be presented at this meeting are the outcome of such correspondence.

Much more gratifying, however, is the fact that a small nucleus of members is not in need of such suggestions. Some of them indeed appear to have become historical enthusiasts.

With reference to the proposed historical collection at Washington a special report has been submitted to the Association at large.

Respectfully submitted,

EDWARD KREMERS.

LIST OF CONTRIBUTIONS.

1906.

Sept. 18, C. A. Mayo: Photographs pertaining to last year's meeting of the Ohio Pharmaceutical Association.

Oct. 1, ————— Newspaper Bureau clippings pertaining to pharmacy.

Oct. 9, F. H. Carter: Material pertaining to the Indianapolis meeting, collected by him as local secretary.

Oct. 15, A. M. Roehrig: A set of circulars of the Revision Committee U. S. P., 1880.

Oct. 15, H. B. Mason: Press Proofs of American Pharmaceutical Association pictures.

Oct. 23, C. A. Mayo: Three photographs of the Atlanta meetings.

Oct. 27, H. M. Whelpley: A parcel of correspondence as president of the American Pharmaceutical Association not to be opened during his lifetime without special permission.

Oct. 28, ————— Miscellaneous documents.

Nov. 2, H. P. Hynson: Correspondence pertaining to the Atlantic City exhibit of the American Pharmaceutical Association.

Nov. 10 and 24, H. M. Whelpley: Miscellaneous documents.

Dec. 2, ————— Miscellaneous letters and documents.

Dec. 18, H. P. Hynson: A manuscript.

Dec. 20, H. M. Whelpley: Miscellaneous letters.

1907.

Jan. 4, H. M. Whelpley: A parcel of letters.

Jan. 5, ————— A parcel of letters.

Jan. 7, ————— A bound volume of Meyer Brothers Druggist for 1906.

Jan. 21, ————— Correspondence pertaining to the A. Ph. A. Invitations to the A. Ph. A. to meet at Nashville.

Feb. 12, ————— A parcel of miscellaneous papers.

Feb. 26, ————— A parcel of miscellaneous papers.

Mch. 13, ————— A parcel of miscellaneous papers.

Apr. 15, ————— A parcel of miscellaneous papers.

May 27, ————— A parcel of miscellaneous papers.

May 30, ————— A copy of A. E. Ebert's paper on Procter.

June ————— A copy of H. M. W's. paper on the U. S. P.

June 29, ————— Papers relative to the banquet tendered the Board of Trustees of the U. S. P. at St. Louis.

July 11, C. A. Mayo: A Rice letter.

July ————— Two photographs.

Mr. Hancock called attention to the fact that there were some suggestions in the report, and he moved that it be accepted and referred to a committee of three, to be appointed by the Chair, for consideration and report on these recommendations. The Secretary suggested that as this

was the only session of the Section, and to-morrow was the last day of the meeting, whatever action was taken must be had at once. He said the suggestion in the report of the Historian was, to provide a small remuneration for clerical assistance, though no specific sum was named. Mr. Main thought it would be competent to adopt the report of the Historian, with the suggestion to the General Session, that a sum be set apart for this purpose; on the suggestion of the Secretary, however, Mr. Main agreed to amend his motion by asking the Council to appropriate such sum as they might see fit for clerical assistance to the Historian. The motion was so put and carried, and Mr. Main proceeded at once to notify the Council, then in session, of the action taken by this Section.

Half a dozen papers appearing first on the program were passed for the time being, on account of the absence of the authors at the moment, and the Secretary then read a paper on "John Milhau," by his grandson, Rene Leon de Milhau.

JOHN MILHAU.

John Tiburce Gregoire Francis de Milhau was born in Baltimore, Md., August 11, 1796. He came of an old French family, the records running back to Bernard, Viscomte de Milhau, who is mentioned in the annals of that province (which is in the south-central part of France) as early as the year 922. During the first crusade a successor of Bernard received the title of "Comte" from Godfrey de Bouillon for his gallant services, and, that the seven sons of the old noble, who accompanied him, should also receive the recognition their services deserved, it was especially ordained that the title, instead of descending to the eldest son only, should go to all the direct male descendants. This title was relinquished by Count Michel César de Milhau, the father of John, on becoming an American citizen in 1803, but, because of the original grant, any succeeding generation still has the right to resume it.

Count Jacques de Milhau, son of Count Augustin and grandfather of John, was a medical officer of high rank in the French army. His son, Count Michel César de Milhau, held a high rank in the French navy, which he resigned to become a planter in San Domingo. He there married Marie de Grenon, a descendant of the families of de Pinsault and de Maison-neuve. During the insurrection of the blacks in 1794, in San Domingo, he escaped with his wife to Baltimore, where he engaged in a manufacturing business, and where his son John was born.

At his father's death in 1813 the circumstances of the family compelled John to leave St. Mary's College, where he was being educated, and take steps to support his mother and sisters.

Although but sixteen years of age, he ventured to embark in business for himself, opening a pharmacy, which he was compelled to conduct for five years, or until his majority, under the name of his clerk. His strict

attention to business and the high reputation for purity that his goods deservedly achieved enabled him to retire in 1827, on what was then considered a respectable competency.

In 1825 he married Philipina Guillou, like himself a child of San Dominican refugees, the wedding being a quiet one, but followed by an interesting incident. A few days after the wedding, Lafayette, then in the United States by invitation of the American Congress, reached Baltimore in the course of his celebrated triumphal tour. Immediately after the Mayor and Alderman had tendered him the freedom of the city, the great Frenchman asked to be conducted to the residence of his kinsman, Count John de Milhau, that he might repeat in person the apologies and explanations that he had already written, that delays in the tour had prevented his acting as groomsman at the wedding just celebrated. He further told the astounded committee that the desire to act in this capacity for their quiet and unobtrusive fellow citizen was one of the motives that most strongly moved him to accept the invitation of Congress and undergo the discomforts of an ocean voyage at his advanced age.

After his retirement in 1827, Mr. de Milhau, (or Milhau, his father having dropped the prefix, "de" at the same time he dropped the title of "Count") sailed for France, where he took up the study of chemistry under the most eminent French chemists; but not being content with Parisian teaching alone, he made three trips to England, to gain what the insular professors could teach him. As a result of this study, he became convinced of the truth of the monad theory and was probably the first in this country to express his belief in this system, which with some modifications, resulting from late discoveries, is now universally accepted.

In 1830, after an extended tour through the West in search of information about the commercial condition of the cities of that new region, he settled in New York, opening a store at the corner of Maiden Lane and Broadway. The business was removed in a few months to 183 Broadway, where it remained until a few years ago, when it removed to 205 Broadway. In 1845 an iron front was put on the building at 183, which was a nine days' wonder, it being the first use in this city of the Bogardus system of iron architecture, in which the separate parts are made—in this case, cast—of the correct size and shape at a factory and simply assembled by means of bolts. The whole new front was erected in three days, a wonderful achievement at the time.

Mr. Milhau continued actively engaged in business until 1869, when he retired in consequence of an accident which practically deprived him of the use of his right arm, two of his sons continuing the house under the name of "J. Milhau's Sons." Mr. Milhau, however, maintained a general interest in the firm until his death on December 23, 1874.

Throughout his life, Mr. Milhau was a public-spirited man of the highest type, one of those who, refusing office, are nevertheless always ready to

safeguard and advance the public welfare ; his name is, therefore, closely identified with the progress, not only of this city, but of the nation. He was one of the incorporators of the New York College of Pharmacy in 1829 and 1832, and was elected president in 1848, filling that office for a number of years. He was an incorporator of many charitable and financial institutions, including the Emigrant Industrial Savings Bank and the American Institute, and served as a director of a number of others. While a director of one of the largest banks in the city, in 1861, he was instrumental in organizing a large loan to the government, and in the early days of the Civil War, at the legal interest, thus breaking up a band of speculators who were demanding, with good prospects of getting, thirty-six per cent. During the entire war he kept close watch over the quinine market, defeating every attempt to corner that drug, so vitally necessary for the soldiers in the field, and was one of the most active in all the relief work done in the city.

In 1854 he began his famous war with the well-remembered Jacob Sharp. In that year Sharp had, by corrupt practices, succeeded in getting a charter from the Legislature for a horse-car line on Broadway, Sharp to pay the city no compensation at all for the franchise, although another company stood ready to pay one million dollars for it. Mr. Milhau at once attacked the charter in the courts, and succeeded in having it overthrown. Mr. Milhau was not opposed to the road ; in fact he was one of its strongest advocates, but he held that the city should be a participator in the profits. He advanced the doctrine that a franchise is not a mere permission to do a certain thing, to be lightly given without an adequate consideration, but is actually an asset of the city, to be leased only for a definite time under proper restrictions and for a full compensation. This idea was greatly ridiculed when it was advanced by Mr. Milhau, but its truth was gradually recognized, and it is now universally regarded as a fundamental part of municipal law. It was an attempt to ignore this doctrine that led to the "gas riots" in Philadelphia about two years ago. Until the day of his death Mr. Milhau opposed the granting of this franchise unless under the proper conditions, and the influence of his single-handed fight for the community's welfare was so great that it was not until 1884, ten years after Mr. Milhau's decease, that Sharp succeeded in getting it, and then only by bribing the Board of Aldermen.

Perhaps his greatest service to the public was in connection with the passage of the law forbidding the importation of impure and adulterated drugs, in 1848. For many years there was nothing to prevent the importation of such drugs, and unscrupulous men, taking advantage of such a condition of affairs, so flooded the market with inferior and false wares that genuine articles almost disappeared. Realizing the danger to the public of such practices, John Milhau demanded their suppression. He was vilely slandered, threatened with bodily and business injury, harassed

by damage suits (the courts, however, upholding him in every case), and subjected to all the annoyances that the men engaged in this iniquitous traffic could devise, but in spite of all, backed by the New York College of Pharmacy, he persevered, and in the year mentioned forced through Congress the law "to prevent the importation into the United States of fraudulent, adulterated, inferior or deteriorated drugs."

One consequence of this battle for the right was his election to the presidency of the New York College of Pharmacy, which had so well seconded his endeavors, and a further consequence was the formation, in 1851, of the American Pharmaceutical Association.

Chairman McIntyre, commenting on the paper just read, said that Milhau himself told him upon one occasion how he came to be an apothecary: that his father wanted to raise some money to save some property in San Domingo, and was referred to a certain old Spanish apothecary, in Baltimore, who lent him the money. This so impressed young Milhau, who was with his father upon this occasion, that he determined to take up the calling of pharmacy, as he said it seemed to him it must be the most profitable business in which he could engage, as this old Spaniard seemed to have more gold than anybody.

Mr. Lowe moved an expression of appreciation of the paper by the grandson of Milhau, and that the paper be received and referred to the Publication Committee, with the request that it be published in the Proceedings.

Mr. J. F. Hancock seconded the motion, and proceeded to pay his tribute to Milhau as an interesting character and highly qualified pharmacist, who was eminently successful in business. He was at one time associated in business with J. M. Laroque at the corner of Baltimore and Harrison Sts., in the city of Baltimore.

Laroque had been a pupil of Ducatel, a French refugee from San Domingo, during the insurrection of 1792. He had been educated in Paris and when he established his pharmacy in Baltimore it soon became the most distinguished establishment of its kind in the City. Ducatel molded the character of Pharmacy in the early years of the City and several of the most reputable pharmacists learned pharmacy under his instruction.

It has been said that Milhau was the author of the famous "Florida water" which had a large sale in the early day of perfumery and is still in demand.

When Milhau left Laroque he went to France to perfect his pharmaceutical knowledge and when he established himself in business in New York City he prepared Florida water from the original formula as did also Laroque in Baltimore. It was the perfume par excellence of that time. The late Geo. W. Andrews was also a pupil of Ducatel. Both Laroque

and Andrews were well-trained pharmacists and they each established themselves in business on Baltimore St., near the spot where Ducatel had his pharmacy, but after it had ceased to exist, Laroque went into the proprietary business and was successful. Andrews had a great reputation with physicians and the public and had a large prescription trade. In those days trade was largely local and advertisements had local application, so that Milhau's Florida water in New York and Laroque's in Baltimore, both from the same formula, did not conflict to any great extent.

Mr. McIntyre added the information that it appeared that the father of Milhau was not successful in business in Baltimore, and left quite a large indebtedness, every dollar of which indebtedness was paid off by his son.

The motion of Mr. Lowe to receive and refer was then put and carried.

The Secretary said the next item on the program was a paper on George D. Coggeshall, by the Chairman. The Chairman did not consider it worth while to read the paper, however, and suggested that it be filed. He said that Coggeshall was at one time his employer; that he went with him in 1842.

The next paper on the program was one on Chas. Ellis, by Mr. Remington, which the author read as follows:

CHARLES ELLIS.

BY JOSEPH P. REMINGTON.

In 1874 the following memoir was prepared by the writer as a tribute of an assistant to a preceptor. It is revived now in order that the American Pharmaceutical Association should have this record of the life of one of its founders in its collection, and under the head of "Reminiscences" the writer has placed some notes which may be of value by bringing to our remembrance some of the characteristics of this noble man.

Charles Ellis was born at Muncy, Lycoming county, Pennsylvania, first month, 31st, 1800. His father, William Ellis, had emigrated from Wales, and formed one of the noble band of men who had given up the comforts of civilization, the ties of kinship and friendship in their own country, to endure privation, toil and hardship in the forests of ours for the sake of preserving a conscience void of offence before God. He belonged to the Society of Friends, and his wife, Mercy Ellis, was one of the most widely known and highly esteemed preachers among them. William Ellis possessed himself of large tracts of land in Lycoming county when but sparsely settled, and by well-directed industry and the exercise of the manly qualities which were characteristic of the Welsh Friends had the satisfaction of seeing the wilderness gradually disappear to make way for the thrifty farmhouse and village, and the flourishing condition of this portion of the State is directly traceable to the influence of such worthy pioneers.

Charles was the fifth son in the family, which consisted of eleven children, and his father's death, occurring when he was but six years of age,

left the responsibility of rearing this household with his mother, who proved well fitted for the labor of training them in the paths of rectitude and wisdom. His love for truth, his watchful care to avoid injuring any of his fellows either by word or act, and the gentleness which so characterized and ennobled the man in his mature life no doubt received its first impulse as he listened to the teachings and profited by the example of this faithful parent. Foreseeing the necessity of a better education for them than could be afforded in the common schools of this thinly-settled neighborhood, she employed a competent teacher to instruct them. Thus, from his sixth to his fifteenth year, he was carefully taught at home, and when he arrived at the latter age he was prepared to enter a school at Manhattanville, New York, where he received an excellent education, which still further fitted him for the duties of the active life which was to follow. On leaving school, in 1817, he came to Philadelphia, and choosing the profession of pharmacy as affording the best outlet for the exercise of the tastes with which he had been endowed, he had the good fortune to obtain a position as an apprentice in the shop of Elizabeth Marshall to learn the "art and mystery of the apothecary." This establishment was on Chestnut street between Second and Third streets, and was in the full tide of prosperity under the skillful management of the talented daughter of Charles Marshall (the first president of the Philadelphia College of Pharmacy). The store had earned an enviable reputation through the exertions of its founder, Christopher Marshall, who carried on the business during the time of the Revolution with credit and success, and on his son Charles attaining his majority he was admitted into partnership with his father and elder brother, and subsequently, on their retirement, succeeded to the proprietorship. Charles Marshall was well qualified to conduct the apothecary business as it was carried on at this time, for it was necessary then to be both botanist and chemist, not only to make tinctures from drugs which had already been gathered and in store, but to go out into the woods, collect the plants, dry and powder them, and then make the preparations, for there were no laboratories for supplying finished products to pharmacists as there are now. He largely increased the reputation of the store, and on his retirement his daughter, before mentioned, succeeded him.

It was into this shop, with its dignified maiden pharmacist at the head that Charles Ellis started on his career, and in the course of his apprenticeship he had a number of companions, among whom were Frederick Brown, Sr., Samuel P. Griffiths (son of Dr. Griffiths), Dillwyn Parrish, Isaac P. Morris, names that have since become well known in their profession. It was not long before Charles, by dint of industry, perseverance, and the exercise of those qualities which make the pharmacist honored, respected, and successful, was called upon in connection with Frederick Brown, to assume the management of the establishment. In the year 1826, he asso-

ciated himself with Isaac P. Morris, and purchased the business, thus becoming part owner of the store in which he had passed so many years. The firm of Ellis & Morris, although highly prosperous, gradually emerging from a retail to a wholesale business, was not destined to remain in business very long. About 1830, Isaac P. Morris withdrew from the partnership, and subsequently founded the extensive and well-known Port Richmond Iron Works, leaving Charles Ellis the sole manager of the business, which still continued to steadily grow. The increased amount of responsibility which the remaining partner was called upon to assume caused a rapid development in his character. A friend who knew him intimately, thus speaks of him :

"It is impossible to place too high an estimate on the influence exerted by him, not only on his own profession, but the community at large. Who, but the physician himself, can appreciate the anxiety with which he investigates the nature of disease and prescribes the appropriate remedy? With prudent caution the symbols of the required dose, and the directions for the appropriate combination, are placed upon the paper ; but the effect depends upon the quality of articles employed ; the care with which the quantities are measured or weighed, and the skill with which they are compounded. The character of Charles Ellis, in every one of these points, stood unquestioned, and the medical adviser went on his way to assume other responsibilities, free from the distracting and depressing influence of dread, when the prescription was entrusted to his care for preparation ; and this spirit of confiding trust was extended to those educated by him, so that to know that the materials used in compounding were purchased from Charles Ellis was ever accepted as a guarantee for their purity. This was no trifling honor, no humble achievement, and it was acquired not by boastful pretension, nor by advertising arts, but by the simple, quiet, and above all, honest attention to the duties of his position. His entire life, in all its relations and outgrowth, was the simple development of this one principle, and hence it became, as nearly as fallen nature may do, a perfect life, so far as it was subject to finite observation and judged by human standard."

In 1821 the Philadelphia College of Pharmacy was founded, and from that date did Charles Ellis not only take great interest, but actively labored for its advancement. During the first few years of its existence, when it was scarcely more than a name, he was always found at his post, ready to do his part. Though one of the sixty-eight original members of the college, at his death he left but three of the sixty-eight members still living ; and it will be seen, by a consultation of the minutes of the college, that he was an active member for over half a century, over forty years of which was spent in an official capacity. In 1828 he was elected Recording Secretary, and served acceptably in this office for fourteen years ; at the end of this time (1842) he was chosen First Vice-President, which position he

held for nearly twelve years—until 1854, when he was tendered the highest office in the gift of the college, that of President—and he continued to discharge his duties in this connection for fifteen years. The files of the "American Journal of Pharmacy" reveal a number of contributions from his pen, and he served for forty years as one of the members of the Publishing Committee, the greater part of the time holding the position of Treasurer. This office was one that was beset with difficulties. During this long period of forty years his services were rendered gratuitously, and the labor involved of keeping the accounts, distributing the "Journal," making collections, etc., was of no light character. "An instance of long, disinterested service rarely met with in the annals of journalism."

As President of the college, it was his duty to confer the degree of Graduate in Pharmacy at the annual commencements, and the fulfilment of this duty was characterized by his usual dignity and modesty. In an address delivered on one of these occasions, he uses the following language, which is just as appropriate in this day, when pharmacy has received a recognition as a separate profession, as it was then :

"The improved condition of pharmacy in the present day, the elevated position it has assumed in Europe and is beginning to hold in this country, is entirely owing to its being taught and cherished as a separate science; whilst in those places where the extemporaneous combination of remedies has been retained by the physician, pharmacy has risen no higher than a mere art. Its proper cultivation and pursuit are entirely incompatible with the arduous duties of medical men, who, aware of the advantage that would arise to society from this division of labor, have in this city set a generous example by relinquishing it and all its emoluments into our hands. We have accepted the responsible trust; and an earnest devotion to the science—a determination to procure and vend everything of the best quality, to permit no consideration of expense or trouble ever to induce a momentary inattention to the purity and activity of our drugs, a uniform system of order and cleanliness, and constant personal attention to and supervision of every duty devolving upon us, and an anxious desire to respect and not to interfere with the rights and privileges of the physician, will be the surest evidence we can offer that the confidence has not been misplaced. Unreserved and implicit as that confidence is which is reposed in us by others, are we not called upon in the most emphatic language to be prepared fully for the task we have undertaken? If we are not, if we have not sought knowledge from every opportunity, and drained it from every source, we are playing a part of the deepest hazard, and tampering with our own reputations, if not with the health and lives of our fellow beings. We have much in our power. The discoveries of modern times in medical chemistry have generally been the result of the laborious investigations of European apothecaries. They enroll in their number men of profound learning, extensive acquirements in every branch of

natural science, in a word, they are ornaments to their country and to the age in which they live. May we not imitate their example, and by endeavoring to extend the boundaries of human knowledge, elevate our business to the rank of a liberal profession, which it must hold, if not fully attained by the exertions of those who are now contending for pre-eminence, it will be by others who succeed us."

These words, spoken forty years ago, when pharmacy as a separate science was almost in its infancy, reflect the mind of the author. We see here how his earnest spirit longed for a higher grade of qualification in those who oftentimes hold the balance which is to decide a case of life or death. He lived to see his aspirations partially realized. That he had been aptly chosen for the position which he occupied as President of the college, is well shown by his careful attention to its duties, as well as by the almost parental interest which he manifested in the welfare, not only of those who were employed under his own roof but in every young man upon whom he conferred the degree of Graduate in Pharmacy who sought his aid. Whilst his interest in our college was of the most active and useful character, he still contributed a large portion of his time to pursuits which tended to alleviate the sufferings of the diseased and helpless, in elevating the oppressed, in educating the ignorant, and in many ways he proved his faith by following the precepts of the One Master whom he delighted to serve.

In early life he was often solicited, by his fellow-citizens and neighbors, to take part in the affairs of civic government; but a sensitive nature like his shrank from political associations, and found more congenial employment in works of benevolence and charity. He was for many years a manager of the "Friend's Asylum" for persons deprived of their reason; the Society for the Support and Establishment of Charity Schools, founded long before our free schools were known; the Philadelphia Society for Alleviating the Misery of Public Prisons; the House of Refuge for Juvenile Delinquents; Wills' Hospital for Diseases of Eyes and Limbs; the Orthopaedic Hospital for the Cure of Deformities and Nervous Diseases; the Philadelphia Dispensary; the Tract Association and Bible Society of the Society of Friends, were among the institutions that claimed his active sympathy and support.

Charles Ellis was a consistent member of the Society of Friends; early in life he took a warm interest in the affairs of this religious body, and his voice was frequently raised in support of active evangelical works.

The retrospect of Charles Ellis' life presents the view of an earnest pure-minded Christian, with a heart overflowing with the greatest of gospel virtues, charity, striving to live, with his utmost ability, as the great Head of the Church counseled; mild and unassuming, but never compromising with evil; actuated by high principle and strict integrity of heart, he was still urbane and courteous to all with whom he came in contact, and this,

not assumed with the view of seeking popularity, but flowing as naturally as sweet water from a pure fountain.

"The good man's arms are folded now,
The great man's race is run :
The warm, true heart and thought-worn brow
Rest, for their work is done."

J. P. R.

REMINISCENCES.

One of the most notable attributes of Charles Ellis was kindly sympathy. He was full of tact. His manner was unobtrusive and gentle. On one occasion a well-known pharmacist who had been in bad health visited the store to make a purchase and while there was seized with a hemorrhage from the lungs. It was necessary for him to assume a reclining position at once. The store was crowded but at the rear in the packing department a bin filled with hay was placed for convenience to the packers. The suffering pharmacist was slowly conducted to this spot and willing hands soon distributed upon the floor a comfortable, clean resting-place. When Charles Ellis heard of the mishap he immediately left his counting-house and stooping over assured his friend of his sympathy, but not satisfied with this he lay down upon the floor and soothed him and comforted him as best he could until the physician arrived.

The business qualifications of Charles Ellis were of a high order. His qualities of honesty, integrity and industry, enabled him to command throughout his life the confidence of his fellows, but these alone will not suffice to conduct a successful wholesale drug-house. The ability to select employes and apprentices, as they were called in his day, has been shown by the long list of Ellis' boys, as they were termed at the College of Pharmacy—the majority of whom are successful druggists, business and professional men to-day. Although Charles Ellis was never fond of display of any kind or description, and shrank from appearing in public, no one could fail to be impressed with his dignity and charm of manner on public occasions, while his personality attracted strangers in a most remarkable manner.

His manner towards a customer was perfect. The writer had many opportunities of observing his business methods. In the front of the store close by the main entrance there were always placed three or four cases of gum-arabic. Care was taken to see that they represented the best grades, but there was always a slight difference in the color and grade of the gum. Much of his time during the most active hours of business when his duties in the counting house permitted, was spent upon the main floor overseeing the activities and receiving customers. He was especially fond of calling attention to "olive oil" and especially fine drugs like camomile flowers, cinnamon bark, etc., etc. He rarely failed to accompany the customer to the door and then passing his hand through the gum arabic he would say,

"Oh, has thee seen this gum-arabic," and digging up a piece of blue paper he would empty a handful upon it and it was very rare indeed for the customers to depart without leaving an order for five or ten or maybe twenty-five lbs. of the gum.

A few months ago an old druggist in paying his tribute to the memory of Charles Ellis said, that as long as Mr. Ellis lived he was always overstocked with gum-arabic, "for I never could resist his abilities as a salesman, for you always left the door-step feeling that he had conferred a great benefit upon you by permitting you to possess some of the finest gum to be had in the market at a reasonable price."

The very first day that the writer entered the drug business, January 1, 1863, the plaster room, as it was called, became the scene of the first exploits of the tyro. The firm had a large sale for "corn 'plasters." A specially prepared soap plaster was spread upon selected chamois skins and the plaster was then laid upon a block, like a butchers' block, and a circular punch which cut out the outer and inner circle was placed upon the plaster and a stroke of the mallet completed the operation. The work of the first day was interesting, but for a daily occupation it would have become monotonous, were it not for what was called "plaster day." This occasion was an event which was looked forward to with much excitement, for was it not given out by the chief of the department that on that day Mr. Ellis presided at the most important function. The firm sold enormous quantities of spread adhesive plasters, the plaster itself was not made at the store at 7th and Market streets, but at the laboratory at 6th and Morris streets. The plaster which consisted mainly of lead plaster with a small proportion of resin, while in a soft condition was run into clean sugar barrels where it cooled and on the day proceeding the great occasion it was carted to the plaster room in the store. This was a long room and the plaster apparatus consisted of a steam jacketed copper hopper resting upon a steel-faced cylinder capable of being heated. Behind the steel cylinder a roll of 1500 to 2000 yards of calendered muslin was placed. The end of the muslin was passed under the hopper and pulled to the end of the room, about forty feet, and attached to a large flat-faced wooden wheel.

Winter time was usually chosen for spreading the plaster because of the ease with which the spread plaster was cooled. When everything was ready the plaster was transferred, after straining, to the smaller kettle having a specially constructed faucet; this was raised by a small derrick, to a strong support immediately over the hopper. Alcohol lamps were lighted immediately underneath the steam roller and smaller kettle, and word was sent to Charles Ellis that everything was ready. The large wheel, at the end of the room, was presided over by a native of the Emerald Isle, named Austin, but who was more popularly known as "Jerry."

Upon the appearance of the head of the establishment the real work

began. A wooden stirrer, reserved especially for the occasion, was handed to Charles Ellis, who had in the meantime donned a clean paper apron which was tied so that there could be no possibility of any of the drops of plaster touching his immaculate attire. The thickness of the layer of the plaster, upon the muslin, was regulated by two levers which were weighted so that a uniform thickness was maintained. When all was ready the word was given to Jerry and the wheel slowly revolved.

From one and a half to two hours was usually consumed, and Charles Ellis would entertain the boys with remarks calculated to improve our knowledge. One mild joke did service at nearly every plaster spreading; naturally Jerry's part in the work, towards the end of the two hours, would become monotonous, there was nothing to do but turn the wheel, and as it was known that he was an enthusiast in the hobby of breeding goats, in the lower section of the city, his steadiness in turning the wheel would vary; when this time would come and the wheel would be traveling too fast, Charles Ellis would remark: "Ah, Austin's getting hungry, he is thinking about something else."

On the next day the spread plaster was reeled off in five-yard lengths upon boards; when the "plaster boys" would place white tissue-paper upon the plaster, and rolling each up, deposit it in a box. Every one was late to dinner on "plaster day," and Charles Ellis required one or two days' notice in advance, and many an important engagement for him was broken that he might personally superintend this part of the work.

Although there were many occasions when our carelessness or inability to cover all of the details for plaster day might have caused irritation, I never heard Charles Ellis say an unkind word or scold the boys. Such was our respect and love for him that his mild criticism sufficed to prevent a repetition of the offense.

One other notable occasion in the history of this store was the annual visit of the head of the Shaker Settlement at New Lebanon, New York. The Philadelphia firm were the agents for selling herbs pressed into packages containing 1 pound, $\frac{1}{2}$ pound, quarters and ounces. A full assortment of these were kept in the second story of the building, arranged in compartments. Every few months it was the duty of two of the older apprentices to take an account of stock in order to replenish it. These occasions were used by some of the boys as quiz examinations. The Shaker labels contained the name of the drug, the English name and the botanical name, and one of the boys would note the stock in the compartment, calling out the amount to the other who would make a note of it and then the quizzier would ask "What is the botanical name?"

As questions were likely to be asked in the College examinations on these subjects it can be seen that it was possible to cover easily all of the official drugs and a much larger number of those which were not official. One of the reasons why Ellis' boys usually passed good examinations at

the College was due to the liberal spirit of Charles Ellis and other members of the firm, who encouraged the habit of quizzing, which was universal in all of the departments. The atmosphere for the boys was one of continual inquiry and the graduates took much delight in cornering an apprentice by giving him what was called a "poser."

In addition to this the long service of Charles Ellis as president of the College, the issuing of the American Journal of Pharmacy from the store and the inspiration of having such a leader, helped greatly in forming the characters of those who were among the privileged ones selected to serve under this man whose name will always be held in affectionate remembrance by his "boys."

The chairman said he knew Ellis well, personally. He was the chairman of the joint meeting of the Colleges of Philadelphia and New York that laid the foundation of this Association. He himself was present at the meeting, and knew well most of the men that were there.

Mr. Main moved that the paper be received, with the thanks of the Section to the writer, and that it be referred for publication, either in the Proceedings or in the "Bulletin," as might be deemed best by the Publication Committee. This motion was seconded by Mr. Hancock and carried. Mr. Lowe, in this connection, suggested that he thought it would be entertaining to the Section to have Mr. Remington relate his story of the "Wooden Bench;" he said he thought the Section could well spare a few moments for that purpose.

Mr. Remington, at the invitation of the Chair, then proceeded to relate this incident of his early life, when he was an apprentice in the establishment of Chas. Ellis. He said he was at first very much awed by his surroundings there, as he was only seventeen or eighteen years old. In those days they had a speaking-tube upstairs, with a whistle that had a peculiar kind of wail to it to attract attention. He did not know what the sound meant the first day he was there, but he was soon enlightened, and on the second day he found himself at the speaking-tube to answer a call. He heard an unfamiliar voice through this tube wanting to know who was there, and when he replied, he was told—as he understood it—to bring down the "Wooden Bench." He was too scared to ask any questions, but proceeded to inform "Jimmie" Anderson, who was making a lot of citrate of magnesia, that they sold by the barrel, what Mr. Ellis wanted. When this worthy gentleman heard that Mr. Ellis had called for a "Wooden Bench," he roared with laughter, and said, "That is not what he wants, take this book to him;" and he gave him a copy of the United States Dispensatory, published by Wood and Bache.

Mr. Hallberg was next called upon to speak upon the subject of the Ebert memorial volume.

Mr. Hallberg said that the fact that the committee was able to complete the Ebert memorial volume by the time of this meeting made it unneces-

sary for him to give any sketch of the life of the late Albert E. Ebert. For the information of the Section, however, he would like to say that a committee was appointed, shortly after the decease of Mr. Ebert on the 20th of November last year, and he was charged with the preparation of a memorial volume. One of the members of the committee, Mr. Whelpley, of St. Louis, had collected a great deal of matter suitable to be incorporated in a book of this kind, and that had enabled the speaker, who had charge of the work, to get it out in time to bring it to this meeting. The Council of this Association had decided, he said, that every member of the American Pharmaceutical Association should have a copy of this book, and had provided for the printing of additional copies, so that not only every member of the Association might have a copy, but also that copies might be supplied to pharmaceutical institutions and journals that it was thought might appreciate them. These volumes would probably be sent out with the annual report, in order to save postage; but those present at this meeting might secure a copy as long as the copies brought to the meeting lasted. Mr. Hallberg said he had about one hundred copies with him here. He said he would have presented this subject this morning, but he thought perhaps to-morrow, at the closing session, might be a more appropriate time, as the number present would very likely be larger, and the members would be more likely to care to have the book when on the point of leaving after the adjournment of the meeting. He said with the permission of the Chair and the members he would read the valedictory as published in the volume, which explained the object of getting up this book.

This work is largely a compilation of expressions and opinions from fellow pharmacists, many of whom were his life-long friends.

These pages reflect no one man's views, but the impressions of practically all of those who had worked and associated with Ebert during his long career and who knew him most intimately.

This volume is wrought in no vainglorious spirit, but in an endeavor to demonstrate, especially to the younger generation of pharmacists, simply what one man has done to advance their calling, and incidentally to pay him a well-deserved tribute.

The Committee on Ebert Memorial was composed of James Hartley Beal, Ohio; Conrad Lewis Diehl, Kentucky; John Francis Hancock, Maryland; Lewis Christopher Hopp, Ohio; Edward Kremers, Wisconsin; Caswell Armstrong Mayo, New York; Joseph Price Remington, Pennsylvania; William Martin Searby, California; Samuel Airus Darlington Sheppard, Massachusetts; Henry Milton Whelpley, Missouri.

LEO ELIEL, Indiana, *President Ex officio*.

CARL SVANTÉ NICANOR HALLBERG, Illinois, *Chairman*.

Mr. Hallberg suggested that those who attended upon the session to-morrow and cared to have copies of this volume should leave their cards when they got the book, so that duplicate copies might not be furnished them. He also said that those leaving to-day could obtain copies, if desired.

Mr. Hallberg said it might be proper to add that a spontaneous move-

ment had been inaugurated for the collection of a fund for an Ebert memorial—possibly a monument, possibly something else. He said this was an entirely unsolicited contribution and came from all over the country, and the suggestion had been made that when these volumes were sent out a subscription blank be inclosed with them, that those who desired to be identified with the Ebert memorial might use this blank in making remittance. He further said that, speaking for himself, and not for the committee, he thought this movement might be used to advantage in promoting the Procter memorial movement; that he would like to see similar movements started in New York to commemorate that great trio, Rice, Squibb and Bedford, and in Philadelphia, for instance, for Maisch, Parrish and others; he thought that by getting up a local spirit of this kind in the various large centers the different funds might be joined with the Procter monument fund, and the necessary amount of money, say \$25,000, might in that way be secured to place in the Smithsonian grounds at Washington a monument dedicated to Procter and American pharmacy, with tablets dedicated to the memory of Ebert, Bedford, Squibb, Rice, and possibly some that might come hereafter.

The Chair called for action on the report, and Mr. Sheppard moved to receive and spread on the record, which motion was seconded by Mr. Lemberger and carried.

The Secretary here called attention to the fact of the large amount of business coming before the Section for consideration, and said it was evident that one session of the Historical Section was not enough. He expressed his pleasure at the interest being developed this morning and said there would be much work that they would not be able to touch at all.

The Secretary then called on Mr. Sheppard to speak a few moments upon the subject of Henry Canning and William Goodwin, as set out in the fifth and sixth items on the program.

Mr. Sheppard began by exhibiting a picture of William Goodwin, a man ninety-one years of age in January past. He said he brought this picture along, not because it was historical,—for it would not be a matter of history for ten years yet, he thought,—but as a matter of interest to the members. He said he had talked to Mr. Goodwin a short time before he came to this meeting, and had asked him how he felt, and his reply was "Fine!" He related that Mr. Goodwin said to him that it was claimed when a man gets to be between ninety and one hundred, he begins to go down hill, but that he did not believe that he would ever feel that way himself. He said Mr. Goodwin was a living example of the merits of "The Simple Life" that we hear so much about. He retired from active business when he was only forty five years of age, and established himself in comfort and quiet in the little city of Newburyport, and had been blessed with great longevity, coupled with the full possession of his physical and mental faculties. It has been said that a man is as old as his

arteries, and Mr. Goodwin has the arteries of a man of sixty, instead of one on the rise of ninety.

Continuing, Mr. Sheppard said this Section had lost, during the past year, one of the best men in the American Pharmaceutical Association, the one man in New England who was loved, perhaps, more than any other—Henry Canning, of Boston. His work for this Association had been so good that, in 1880, the Association made him a life member in appreciation thereof. He said Mr. Canning had literally worked himself to death. He was just about Mr. Sheppard's age, and was President of his College for a number of years, in the most critical period of its history. At the organization of the first National Retail Association of Druggists, Henry Canning did great work, and Mr. Sheppard said he could not let this occasion pass without paying a tribute to his memory—to the memory of a man they would probably miss more in New England than any other that could be taken from them.

The Secretary indicated the subject of "Missouri and the A. Ph. A. in 1867" as the next topic, and called on Mr. Whelpley to speak on it.

Mr. Whelpley began by saying that he again desired to call the attention of the members to the Constitution in book form that he had brought with him to the meeting, which was supposed to be signed by all the members of the Association. This volume was started in 1852, with the beginning of the Association, and contained the names of members dating back to that time. It was of great historic interest, as it bore the signatures of the first officers of the Association, and those of its earlier members. At each annual meeting a page or more was devoted to the signatures of those in attendance who had not already signed the Constitution. He said if there were any present now who were members of the Association, and had not signed this book, he would like to have them do so before they left, and that the book would be left on the Secretary's table for this purpose.

Mr. Whelpley then took up the subject of the "Preservation of Photographs" (Item 8 on the Program), which always have an added value with the lapse of time, and described a simple but convenient plan he had adopted for preserving them and making them easy to find upon occasion. He had had a case made some 36 x 24 x 10 inches, occupying but little space, and in this case were placed a series of ordinary paper collar-boxes, lettered A, B, C, etc., and in these boxes were deposited, according to the initial of the name, the photographs collected from time to time, those mounted on cards a little too large for the boxes being trimmed down to a uniform size. He gave an optical illustration of the readiness with which any desired photograph could be produced, by taking out at random from his files before him any picture he wished, and exhibited a number of photographs of prominent pharmacists of the Middle West, etc.

Speaking on the subject of Missouri and the A. Ph. A. in 1867—that is,

at the time this organization previously met in New York City—he said that Missouri had seventeen members at that time, or twenty-three per cent. of the total membership. These seventeen members all resided in the city of St. Louis. The first one joined as early as 1853—Mr. G. T. Chamberlain. Of that number only two were living to-day, Mr. H. W. Scheffer and Dr. Enno Sander, and he said these gentlemen had asked him to convey to the members the regret that they could not be present on this occasion. Mr. Whelpley said it was interesting to note that up to 1867 no member of the Association from Missouri was dropped for non-payment of dues, resigned, or even died, from 1853 to 1867, a record which he thought was rather exceptional. He said that Mr. F. W. Sennewald, of St. Louis was present on the occasion referred to, and read a paper on “Chrysophanic Acid in Senna”—one of the few scientific papers presented at that meeting. This man, up to the time of his death, was one of the most prominent pharmacists of Missouri, and was greatly interested in the American Pharmaceutical Association.

Mr. Whelpley also referred to three communications that he had received from Mr. P. C. Candidus, of Mobile, the newly-elected Honorary President of this Association. He said Mr. Candidus had sent in the names of three new members from Mobile, and had written that he would have sent more, if it were not for the fact that his store was now located in the suburbs of the city, and he had recently lost his clerk and could not get down town to secure another; and that, anyhow, he would have difficulty in replacing this clerk, as he was eighty-two years of age, and clerks of that age are scarce. He had also received a telegram from Mr. Candidus acknowledging the advice that he had been elected Honorary President, and sending his greetings to the Association.

Mr. Whelpley then proceeded to exhibit quite a number of lantern slides, showing pictures of old prescription-files—one of especial interest being a string of three thousand prescriptions coming to Procter's store the first year he was in business—a picture of Dr. Otto A. Wall, of St. Louis, taken in 1884; pictures of Parrish, Maisch and others lights in the pharmaceutical world, etc., and made pithy comment upon each slide as it appeared. He wound up with a picture of himself when but two years of age, and humorously called attention to the different style in which he wore his *hair* in those days as compared with the present.

The Secretary said he was sure the Section appreciated the work of Mr. Whelpley, and he was himself obligated to him, because it was at his personal request that he undertook it.

The Secretary here announced that it was the Chairman's desire to have the nomination and election of officers at this juncture, and then proceed with the reading of papers. Nominations were then called for. Thereupon Mr. Main nominated for Chairman Mr. E. V. Howell, of North Carolina, and Mr. Hancock seconded the nomination and moved to close

nominations for this office. It was so ordered, and Mr. Holzhauer moved that the Secretary cast the affirmative ballot of the Section electing Mr. Howell Chairman. This motion was duly seconded and carried, and the Secretary announced that he had cast the ballot as directed, and declared Mr. Howell duly elected Chairman. Nominations for Secretary were then called for, and Mr. Hays nominated the present Secretary, Mr. Eberle, to succeed himself. This motion was duly seconded and carried, and on motion of Mr. Holzhauer the Chairman was directed to cast the ballot of the Section electing Mr. Eberle to this office. The Chairman announced that he had performed this duty, and Mr. Eberle was declared duly elected.

The Secretary stated that the next paper on the program was one on "Henry J. Meninger," by the Chairman, and that, without objection, the paper would be filed. So ordered.

The Secretary called for a paper on "Paul Baluff," by Gustav Ramsperger, and Mr. Hancock moved that the paper be received and preserved for future reference, which motion prevailed.

A paper on "The History of the New Jersey Pharmaceutical Association, Continued," by E. A. Sayre, was accepted, on motion of Mr. Hancock, for the files.

A paper on the subject of "A Bibliography of the London Pharmacopœia," by Edw. Kremers, was also accepted to be filed. Likewise, a paper by Wm. J. Schieffelin, entitled "A Contribution."

The Secretary next called on Mr. Francis B. Hays for a paper on "Documents Pertaining to the Anniversary Number of the Druggists' Circular."

Mr. Hays briefly referred to his paper, and he said the volume was here and could be seen. He said he was also on the program for certain documents in connection with that volume. The Secretary had also asked if he would say how he arrived at the fact of the fifty leading men of the last half-century in pharmacy. He told him he would consider it, and would bring the question up in time to see what the Section thought about it. These letters were privileged communications to the publisher, and he did not know whether it would be appropriate to file them. He said he had letters and ballots from such men as Ebert, Lloyd, Hancock, Whelpley, and others. He wanted to know whether there would be any impropriety in bringing these letters here and giving them to the Section.

The Chairman said if there was anybody that had any objection to this, he would please express it, and that without objection he thought it would carry permission for such filing. (No objection was indicated by any of the members.)

Mr. Hancock said he thought Mr. Hays should be thanked for his work in getting out this addition. Mr. Whelpley seconded the motion, and said he should be not only thanked for what he had done for the Association,

but for the good example he had set other editors to save matter that may sometime become of great historic value to this Association. This motion was put and carried.

Continuing, Mr. Hays said he got an inestimable amount of aid in the collection of the fifty most distinguished pharmacists from a man who afterwards was himself included in the list—Mr. Albert E. Ebert. At the Indianapolis meeting last year, Mr. Ebert and he had gone off in a quiet corner and held a long conversation, for which Mr. Hays felt extremely thankful, because it was the last time he ever saw Mr. Ebert; and he gave him aid and encouragement and assistance that he never could have gotten elsewhere. He took more interest in getting up this list than any other one man had taken in the work. The members all knew what valuable aid he could give in a matter of this kind. He made up a list, he thought, of some one hundred and fifty men of prominence, and that list formed the basis from which the writer had done his subsequent work in making his final list of fifty names. Mr. Hays said that if he might be permitted to digress a moment he wanted to say that the privilege that the younger men had of meeting at these Association meetings such men as Ebert and dozens of others he might name, was one not to be lightly considered. He considered it one of the best things in his life as a pharmacist, that he had been able to shake hands with and talk face to face with these older, these distinguished men that made pharmacy what it is. It was an honor to shake hands with the honored Chairman here to-day (Mr. McIntyre), when it was considered that he was present when this Association was founded, over fifty years ago. He did not believe that we stopped to consider what a privilege this was. The Secretary indicated a paper by Edw. Kremers, on "Pharmaceutical Notes from Nattall's Journey into 'Arkansas' Territory," which was accepted to be filed.

The Secretary next referred to Item No. 22 on the program, "Bulletin of the Lloyd Library," and stated that Mr. Lloyd had promised to furnish the Historical Section with the Lloyd bulletins, which offer had been thankfully acknowledged.

The next item was one on the subject of "Some Pharmaceutical Data before and during the Civil War," by Edw. V. Howell, of North Carolina.

Mr. Howell said he would only take time to call attention to an old scrap-book that contained a good deal of data relating to the time before and during the Civil War. The first thing he directed attention to was to the formula of Dr. J. C. Ayer for his Cherry Pectoral; next, to some old newspapers, dating as far back as 1817, and containing a variety of curious information. Also, to some old invoices running back for many years previous to 1869, showing the enormous prices as compared with the present at which quinine, calomel and other drugs sold during the war; also whisky and brandy, Hostetter's Bitters, etc., prices paid in Confeder-

ate money. He referred to data showing that cotton-seed oil was made as far back as 1853, whereas it is generally considered that it was not made until after the war. He spoke of various other items of historical data, which he presented for the files of the Section, including a Pharmacopœia of 1820, a picture of William Simpson, of North Carolina, an ex-president of this Association, and an old New England directory, giving a list of the druggists in the New England States.

The Secretary said the Section appreciated the presentation of Mr. Howell.

The Secretary then mentioned a paper by Caswell A. Mayo, on "Notes on Historical Aspects of the Drug Trade in New York," which he said would be referred, with thanks to Mr. Mayo for his work.

The Secretary then indicated three papers by himself, Items Nos. 25, 26 and 27 on the program, on the following subjects, viz: (25) "Brief Historical Sketch of the University of Texas and its Department of Pharmacy"; (26) "Brief Historical Sketch of Baylor University and its founder, Rufus C. Burleson, and its College of Pharmacy"; (27) "Various Publications of Texas Schools etc.," which he said would be placed among the archives of the Section.

Mr. Lemberger then gave a brief abstract of a paper on drug apprenticeship in the early days of pharmacy:

THE DRUG APPRENTICE OF THE EARLY DAYS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

BY J. L. LEMBERGER.

Personal experience is the basis of all that appears in this communication. A graduate from the Philadelphia College of Pharmacy, class of '54, had at the period of time of which we relate served about four years of his apprenticeship of a term, covered by his indenture of six years and seventeen days, having been apprenticed within seventeen days of his fifteenth birthday; he consequently had about two years of apprenticeship before him until he could enter the real issues or battle of life for himself, the bond could not be annulled except for good lawful reasons, for he was indentured, and the law was equally on the side of his master. If he was passing through the course of instruction in the college of pharmacy and passed a satisfactory examination, entitled to its diploma, said diploma remained in the custody of the college until he was of full age.

The apprentice by indenture was bound to be loyal to his master's interests, and his personal well-being depended on such loyal, faithful service. His compensation in this, and most similar cases in accord with the letter of the contract, provided for him a comfortable home in the family, including his board, washing and two suits of clothing, together with college of pharmacy privileges, and the obligation of the master making him his preceptor, to teach him the profession of pharmacist

in accord with his ability, all to be at the expense of his master, who in turn received his services, which were as varied as the business requirements of the store made them.

It was a real service, as actual as the most pronounced dictionary definition could make it. The apprentice was the general utility fellow about the house and store. A week of vacation during the summer to visit home came as a pleasant oasis comes to the traveler in the desert. The evenings off for college duties constituted the respite from business care.

Promotion followed his capability to be more useful, no special pharmacy law forbidding the assumption of any responsibility, the master was moved to place upon him, so that with his development in the college, beginning with his second year of service, prior to which time he became quite familiar with bottle washing, store cleaning, attending to the stoves, and the practical and free use of the iron mortar and pestle, he learned to powder aloes, myrrh, nutgalls, valerian root, cinchona bark, gentian root, columbo root, cardamom seed, colchicum seed, and as a fact nearly all drugs were in that day powdered at home. The drug mill (Swift's) came at a later period and substituted the iron mortar, and the wholesale drug miller as a distinctive enterprise was a still more recent innovation.

The apprentice youth, if a philosopher, was the sovereign of his province and could be happy in his vocation. If he lacked that grace, he was oftentimes miserable indeed. The writer was of a philosophical turn (in a way), so that the conditions favored master and apprentice alike; as he became mature by added years and the period of full age manhood approached, he realized that the diploma represented a qualitative factor, to the master's profit, but a quantitative nothing to him as a financial factor until the law made him free, and he may be pardoned for feeling that the lines to him seemed hard. The longed-for day came, however, as nearly "all things come to him who waits," and only those who have had similar experiences, what a factor such an apprenticeship could be made to conserve as a factor in moulding the character of the boy and the young man for future work, always provided that the master and preceptor was the proper person.

What were the advantages that took the boy away from the comfort, ease and liberty of the parental roof and home?

In some cases in the olden time, there is no doubt such a school for discipline may have been desirable, where the parents had lost grip upon the boy, and this form of training was the means to a probable better condition. In the case we cite the feature of the incorrigible boy did not exist. A desire to become an apothecary was the motive and factor, and there was no way open to secure a place except to answer an advertisement: "A boy wanted as an apprentice in the drug business," and follow the prevailing custom of submitting to the only arrangement that could be made, be indentured for the remaining period of minor age.

The bond of indenture by law provided for a fair performance of duty on the part of the master toward the apprentice, and was equally explicit in exacting the same requirement on the part of the parent or guardian, and the apprentice himself to his master. An important requirement prohibited the engagement in the bond of matrimony.

In conclusion, you will find a strong contrast with the present day methods of securing apprentices to the drug business.

Mr. Hancock moved to receive the paper last read and refer it to the Publication Committee, with the request that it be published, saying he thought it was a very interesting paper. The Chair said that, without objection, it would take this course, and it was so ordered.

The Secretary said this completed the work of the Section, and he hoped that next year there would be two sessions set apart for the Historical Section.

Chairman McIntyre stated that Mr. William Jay Schieffelin, of New York, was present, and would make a few remarks on conditions one hundred years ago. The Chairman said that Mr. Schieffelin stood in the fourth generation of Schieffelins he had known personally. Mr. Schieffelin called attention to the fact that the matter of the prices of chemicals was not a new one by any means. He said that in a catalogue of drugs and chemicals sold at retail by Schieffelin & Co. in 1804, there was an endorsement to the effect that those prices were approved by Henry H. Schieffelin, Secretary of the New York Drug Association. So the father affixed the prices, and the son approved them as Secretary of the organization named. Mr. Schieffelin said this was interesting as showing that one hundred years ago the druggists of New York did not issue price-lists without first having them examined and approved by the Secretary of the New York Druggists' Association.

There being no further business before the Section, on motion of Mr. Hancock, it stood adjourned *sine die*.

ENTERTAINMENTS AT THE FIFTY-FIFTH ANNUAL MEETING.

IN accordance with the program adopted by the Council prior to the meeting, the customary reception of the officers was held on Monday, September 2, at 9 o'clock p. m., in the spacious corridor leading to the beautiful ball-room of the Hotel Astor. The president, Mr. Leo Eliel, was assisted by quite a number of ex-presidents and their ladies. After the reception the guests assembled in the ball-room, where a couple of hours were pleasantly spent by the younger people in dancing; the temptation to follow the seductive strains of music could not be resisted even by some of the older and more sedate members, who seemed to enjoy the giddy whirl as much as their juvenile partners. Along with the rhythmic music of the orchestra seemed to come echoes of a plaintive wail carrying the well-known words "backward, turn backward, oh time in your flight, and make me a child again just for to-night." A most enjoyable closing feature of the evening was the splendid banquet served in the adjoining hall, where several hundred guests were seated at small tables and did justice to the many tempting viands placed before them.

On Tuesday and succeeding days the ladies were treated to automobile rides to Bronx Park and other points of interest, where lunch was served, and under the guidance of most affable committees interesting trips were made to the great stores of the shopping district. Special card-parties were features much enjoyed during the afternoons and evenings while the men were in attendance upon sessions of the different Sections.

For Wednesday evening arrangements had been made for a special theatre party composed mainly of ladies, to witness the performance of a popular play, "The Great Divide," at Daly's Theatre. On Thursday at 10.30 p. m., after adjournment of the joint meeting of the Boards of Pharmacy Association and the Conference of Pharmaceutical Faculties, a large number of the members repaired to Allaire's, on Third avenue near Eighteenth street, to participate in a students' "Kommers" tendered the visitors by the Deutsche Apotheker Verein of New York City. A more pleasant evening was perhaps never spent by those present and octogenarians vied with the younger members in establishing that happy fraternal spirit called for by the occasion, and in making this reunion an event memorable in the history of the Association. As an indication of the per-

fect success of the "Kommers," adjournment did not occur until long after 2 a. m., and much praise was bestowed upon the committee in charge of this entertainment.

As a fitting climax to the week's series of pleasures, all the visiting members and their ladies, together with a goodly number of local associates, were taken on an excursion on board a specially chartered steamer "The Glen," on Friday afternoon, September 6. The start was made about 2.30 p. m. and after a very pleasant trip of two hours for the purpose of giving the visitors a better idea of the two great rivers flanking Manhattan Island, and the many public and private points of interest along the route, both on the New York and Jersey sides, the landing was made at the renowned and only Coney Island. Through the courteous foresight of the committee in charge, every one had been provided with a special book of coupons entitling the holder to admission to the various places of amusement both at Luna Park and Dreamland. The former was visited first at the special suggestion of the committee and at 6.30 p. m. the whole party, numbering between 500 and 600 met at the Steel Pier to participate in a Shore Dinner served in the Casino in most excellent style. Everybody seemed possessed of a good appetite and full justice was done to the steamed clams, chowder, planked bluefish and other gastronomic treats. Formal speeches were dispensed with, but Dr. Wm. Jay Schieffelin made a short address of welcome on behalf of our New York hosts, which was fittingly replied to in words of warm appreciation by Prof. J. P. Remington. A couple of hours were spent after dinner in visiting the various shows in Dreamland, some of which reminded one of similar previous experiences on the Midway at Chicago in 1893 and on the Pike at St. Louis in 1904, and about 11 o'clock the return trip was begun, which latter proved very enjoyable as the night was clear and pleasant. As the boat steamed away from the pier every one taking a final view of the many magnificent illuminations at Coney Island realized fully how appropriately Dreamland had been named and how well substantiated is the claim that nowhere in this country can be found a more beautiful representation of fairy fiction.

Many thanks are due Messrs. T. P. Cooke, C. O. Bigelow, W. C. Alpers, W. J. Schieffelin, T. F. Main and their many associates on the various committees for their untiring efforts to make the New York meeting of 1907 a memorable one in the annals of the Association.

C. C., JR.

REPORT

ON THE

PROGRESS OF PHARMACY.

From July 1, 1906, to June 30, 1907.

BY C. LEWIS DIEHL.

INTRODUCTORY.

THE "Food and Drugs Act, June 30, 1906," the work of the "Council on Pharmacy and Chemistry" of the American Medical Association, and the affiliation of "Local Branches," organized by members of the American Pharmaceutical Association in some of the larger cities, may be considered the most important factors concerned in the uplifting and, consequently, *true* progress of pharmacy during the year covered by this report. In an address before the Philadelphia Branch of the A. Ph. A. (December 12, 1906), Dr. H. W. Wiley says in effect—

"*The Food and Drugs Act* introduces for the first time into this country a national control over interstate and foreign commerce in foods and drugs. The importation of foreign drugs is controlled at the ports of entry under an existing law which was first enacted in 1848. This law not having been specially repealed is believed, under the ordinary construction, to remain in full force except in points in which its provisions are in conflict with those of the new inspection law; but just how far the requirements of the new inspection law must be read into the old law is a matter of purely legal character. It is evident, therefore, that the application of the Act, in so far as drugs are concerned, will be practically to the control of domestic commerce."

Two Standards for Drugs entering into interstate commerce are specially noted in the Act, namely, standards as set forth or indicated in the U. S. P. and the N. F.; second, standards which are placed on the drugs

themselves. Under the terms of the Act it appears that any drug bearing a name recognized in the U. S. P. or N. F. shall be held to conform in strength and purity to the standard therein established or indicated, whether they are marked U. S. P., N. F., or not. If it is desired that these drugs shall conform to any other than that of the established authorities, this standard must be plainly stated upon the label. Drugs which are used for technical purposes are evidently not included in this classification, inasmuch as the definition of drugs excludes all chemicals and all drugs ordinarily so used, *i. e.*, employed for technical purposes. This is so clearly brought out in the law itself as to need no further elucidation; yet, some questions having been raised respecting a discrimination, Dr. Wiley suggests that when substances are used both for medicinal and technical purposes, it would be advisable to state upon the label the fact that they are to be used 'for technical purposes,' when so intended, or to attach some other word so as to show clearly that they are not to be used as drugs. In regard to certain kinds of substances, moreover, the law presents a double attitude. An illustration of this is in the case of alcoholic products. When these are used as beverages it is not necessary to state upon the label the quantity of alcohol which they contain. If, however, prescribed as remedies or drugs, tonics or otherwise, the label must bear the required statement. Dr. Wiley points out some of the difficulties that may arise in determining when some of these products are to be considered as beverages and when as a medicine. Theoretically any such package should bear the percentage of alcohol therein contained; practically it would be rather difficult to enforce such a regulation. The most striking feature of the 'Food and Drugs Act,' however, is that relating to the practical exemption from supervision, as to standards, of the so-called

Proprietary Remedies. Just why the U. S. P. and N. F. should be subjected to such a rigid standard and practically the same mixtures be allowed to go uninspected, when in the guise of a patent medicine, is a question of importance. This is no more strange, however, than the laws regulating the practice of medicine and pharmacy. Those who are legitimately engaged in the practice of these professions are required to take a long course in preparatory training and to secure a license after examination before State and Municipal Boards in Medicine and Pharmacy, and even then they are required to practice their professions under the strict supervision of the law. On the other hand, the quack doctor or the proprietor of a fake remedy may practice medicine through the public press and dispense drugs in the same manner, through the mails, and with the aid of the express companies, without any medical or pharmaceutical training whatever, without securing any license or paying any fees, or without being subjected to any kind of an inspection, save in the placing of the names of a few drugs upon his labels and to refrain from misrepres-

sentation as stipulated by the Federal Act. In other words, that part of medicine and pharmacy which least needs a supervision of the law is practically the only part which comes under its supervision, while the unspeakable abuses which attend the other branches of remedies go practically unchecked. It is in this direction that

The Work of the Council on Pharmacy and Chemistry promises to exert salutary influence. This commendable undertaking, the immediate purposes of which have been sufficiently outlined in a previous report (see Proceedings, 1905, 480-482), has now passed the experimental stage and borne some good fruit. In a paper read before the Philadelphia Branch of the A. Ph. A. (November, 1906), Professor Samuel P. Sadtler gives a lucid account of what has been accomplished by this Council during the first eighteen months of its existence. He says that at the time when the Council was created, "the reputable members of the medical profession particularly were beginning to demand that fakes and sham synthetics be pointed out, and the *Journal of the American Medical Association* was recognized as of such standing and authoritative position before the profession that its advertising columns particularly should be cleared, as far as possible, of this offensive material." But if reprehensible conditions existed with reference to the substances claimed to be synthetics, "what was it when we came to proprietary mixtures with trade-marked word-names, and absolute secrecy as to composition, this secrecy being defended on the ground that valuable proprietary rights might be infringed if the public were told the exact composition? It is hardly necessary to ask the question as to where this kind of a thing leaves the doctor. The proprietor of the remedy may change the composition from time to time, and in some cases they boldly acknowledge that the composition of the remedy has been changed, with no word of information as to strength or exact proportion of the ingredients, and in many cases with absolute falsity of statement as to ingredients present."

The problem confronting the Council being the determination of the exact status of the synthetics and proprietary medicaments advertised to the medical profession, "circulars were prepared, which were sent out to all prominent American pharmaceutical manufacturers, as well as to the agents of the German synthetics and chemical preparations, and publicity was given to this circular also by sending it to most of the prominent medical and pharmaceutical journals. In this circular a number of rules governing the admission of articles to the book

New and Non-official Remedies, and explanatory comments upon the same were published. In addition to this, representatives of a number of the most prominent American manufacturing houses met the Council in conference at Cleveland, Ohio, and in that way laid the ground for active co-operation. "The result is that the Council has had to date some 600 or 700 individual articles (largely augmented since the date of the paper

quoted—Rep.) brought to its attention, in all cases accompanied by samples and whatever literature had been published in connection with them. Forms of labels and circulars were also submitted to the Council, to allow them to judge as to whether the rules which had been sent out were being complied with, so as to justify the admission of these articles in the proposed book. It can readily be seen that a vast amount of work was involved in the study of these many preparations, and the sifting of testimony with regard to them."

The practical results following this work, which at the time of the present report covers a period of nearly two and a half years, may be briefly outlined as follows :

1. Articles of an improper or deceptive character have been practically eliminated from the advertising pages of the "Journal of the American Medical Association," as also from many of the other American medical journals.
2. A large number of articles, the composition of which was not heretofore known or imperfectly understood, have been admitted and appear in the book "New and Non-Official Remedies," which has now appeared in its second, augmented edition, and will shortly appear in a third, enlarged edition. These articles appear under their proper titles, with synonyms, their absolute or essential formula, properties, tests of identity (if any), medicinal action and uses, and doses.
3. The literature accompanying or advertising these articles has also been critically scrutinized and, when found objectionable, corrected, as a prerequisite to their admission to the book or advertisement in the J. A. M. A.
4. A large number of articles has been rejected, both for inclusion in the book and for advertisement, because of failure to conform in any or all respects to the rules.
5. Among these rejected articles were a number about which the claims of the manufacturer, either as to its composition or on the ground of pharmacological action, were so insistent and extravagant, that publication of the findings of the Committee of the Council, to whom the article had been referred, became imperatively necessary. It is perhaps not necessary to say that this was done with proper courtesy to the manufacturers, and with the reasons for not admitting the article to the book.

While the work of the Council on Pharmacy and Chemistry is primarily in the interest of the physician and his patient, it redounds equally to the advantage of the pharmacist, who by the publication of the book, as well as of the articles rejected for cause, is given information heretofore not available. This is particularly true of the rejected articles, about which he may have had his suspicions, but no published information to confirm them ; and, indeed, even when in possession of the knowledge through his own investigation, he probably often hesitated and quite as often failed,

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for reasons of expediency, to publish them. It is therefore the more commendable that in the Council on Pharmacy and Chemistry we now have an authority that does not hesitate to call a "spade a spade," and that will publish its findings without fear or favor whenever such is considered desirable in the interest of the common good.

Another, and not the least beneficent result, following the constitution of the Council on Pharmacy and Chemistry by the American Medical Association, is the incentive which it has given to the members of the two professions to fraternize on a more equitable footing. It is true that for nearly two decades this Association has been represented in the A. M. A. by a delegation in the Section on Pharmacology (originally *Materia Medica and Pharmacy*), with all the privileges of members; but until within recent years there existed very little nearing between the members of the two professions on these occasions, other than the interchange of conventional courtesies. But the two professions, after a gradual "drifting apart," covering a period of many years, seem again to have found each other. It is not material on which shoulder rests the blame for this "drifting apart" in the past, but it is certain that the conditions of commercialism that have prevailed, increasingly from year to year, in the ranks of the pharmacists are largely responsible for the disregard in which the profession of pharmacy is apparently held by the members of learned professions. In a recent editorial (*Pharm. Review*, March, 1907), Professor Edward Kremers pertinently voices this neglect of the profession of pharmacy as follows:

"During the past month there have been published the names of '*The Committee of One Hundred*' the object of which is to secure the establishment of a *national bureau of health*. We are informed that for twenty years the American Medical Association has reported favorably on this proposition, but 'has been unable to secure a large interest in the project, outside of the medical profession.' While the present movement is not a medical movement, but has had its origin with the American Association for the Advancement of Science, the medical profession is fully represented in it. Likewise is the government, so are the clergy and the legal profession; associations and institutions for human betterment are not omitted. But where is pharmacy? We fail to find pharmacy even among those classed as 'Experts on various phases of health work,' or among the 'Additional members.'"

"The American Pharmaceutical Association has left nothing undone to secure a somewhat better standing for pharmaceutical representatives in army and navy. Are we forever to be satisfied with such minor improvements or may we hope that some day in the distant future pharmacy as a profession is to be recognized by the American men of science, as a profession that must be reckoned with, as a profession so strong in the public mind that such a movement as this could never have been undertaken without seeking its co-operation."

Perhaps this laudable ambition may eventually be achieved, but not until pharmacy has in truth again earned the title of a profession, not until commercialism has been subordinated to a position subservient to the true functions of pharmacy, the supply of medicaments for the sick—conditions fairly satisfactory in the past, but slowly and steadily perverted until a modern pharmacy is often such only in the title flaunted over the door. It behooves us, therefore, to so reconstruct and mend our fences that we can prove our title to professional recognition before we sit in judgment on those who are unwilling or neglectful in granting it. Let us hear what one of the foremost American practitioners of medicine, Dr. Solomon Solis-Cohen has to say on *The Function of the True Pharmacist*: "Let me congratulate the members of the Philadelphia Branch of the American Pharmaceutical Association on the important step they are taking to restore the practice of pharmacy in Philadelphia to its elder and more fitting status among the learned professions. It seems to me time that a larger and nobler meaning be given to the term "pharmacist." The true pharmacist has a high function to fulfil—a much higher function than drawing soda water or handing out "proprietarys" over the counter. When the physician ceased to collect and prepare the drugs that he administered and turned over to the apothecary that important duty, in order to devote more time to his own special study of diagnosis, pathology and therapeutics, the apothecary became charged with all the responsibilities concerning the medicaments that had heretofore rested upon the physician. In the evolution of science and of art the responsibilities, both of physicians and pharmacists, have become greater, not less." "The grocer, or the notion dealer, or the six-dollar clerk in the department store, has sufficient knowledge to take a package from the shelf and hand it to a purchaser, or even to decant a portion of it into another container." "As a physician I look to my brother of the pharmaceutical profession for greater knowledge, greater skill and greater assistance than I can get from the grocer's clerk or the errand boy. I am in the habit of consulting with friends in your profession concerning new drugs introduced from time to time, new cures and new preparations of old drugs, the possibilities of new combinations of drugs, that may have been suggested by the exigencies of a special case, as well as incompatibilities, methods of administration, and other matters in which the physician must, in greater or less degree, depend upon the special knowledge, training and skill of the pharmacist. In return, I have been complimented by their inquiries on matters concerning which I may have had special information of use to them. There is no reason why this pleasant relation of confidence and mutual assistance should not exist between all physicians and all pharmacists worthy of the name." "Certainly nothing will do more to extend it and to advance the best interests of the profession of pharmacy than the formation of such an association as you are now about to form in Philadelphia, and the determination on the part

of practicing pharmacists to maintain a high professional level as scientific men and to resist the conversion of their professional standards into trade standards." "A tremendous responsibility rests on the conscientious pharmacist. He is always the active assistant of the physician; he is frequently the path-finder and guide of medical progress in certain directions. Therapeutics, so far as it relates to drugs, must advance in future through the active and intelligent co-operation of chemistry and biology, of pharmacy and medicine. In such advance I look to this Society confidently for leading and for light."

The optimistic view held by Dr. Cohen concerning the favorable influence upon professional pharmacy that can be expected from the Philadelphia branch of the A. Ph. A. is doubtless held by many, and by progressive pharmacists in particular, and this view is further emphasized by the prompt organization of

Local Branches of the American Pharmaceutical Association in the larger business centers. Following the lead of the Chicago and Philadelphia Branches, which were organized during the month of March, 1906, the Maryland (Baltimore), Northern Ohio (Cleveland), Northwestern (St. Paul-Minneapolis), Washington, New England (Boston), St. Louis and New York (City) followed rapidly in the order named, all but New York organizing before the close of the year 1906. It may suffice here to explain that the conditions under which these local branches have been, and others may be, organized are quite simple, the most important prerequisite for permission to establish a local branch being that not less than twenty-five active members of the A. Ph. A. in good standing, and residing within a certain circumscribed locality, shall join in the petition and subscribe to a preamble, constitution and by-laws uniform for all branches. Permission having been granted by vote of the Council of the Association, the local branch may be organized by the election of its officers and the chairmen of a number of committees, the latter in turn appointing their associates, in some cases from both active and honorary members, provided for under Art. III. of the Constitution, honorary members being defined as "Physicians and other Scientists interested in the practice of Pharmacy, and Pharmacists of distinction not residents of the State." Associate members are also provided for, such being all the members of the A. Ph. A. residing within the State who have not become active members of the local branch because outside of its jurisdiction, or for other proper reasons; but these, while entitled to all the privileges of active members, are denied the right to vote or hold office. Each local branch is represented in the Council of the A. Ph. A. by appointing one of its members for that function. The by-laws also provide that monthly meetings be held from October to May, but special meetings may be held on call of the Executive Committee.

It is significant that the by-laws accord rather unusual functions to

"honorary members," inasmuch as they provide that the associates in several of the committees—On Professional Relations, On Science and Tactics of Pharmacy, and On Education and Legislation—shall consist of both active and honorary members. The underlying motives for this innovation is doubtless the desire to inaugurate and foster a more cordial understanding than has hitherto prevailed between the professions of medicine and pharmacy, and from this standpoint the innovation must be hailed with gratification. Indeed, there has been an increasing tendency to hold monthly meetings of the local branches—notably in Philadelphia, Chicago, Cleveland and Baltimore—jointly with members of the medical profession, and there is little question that, as the work of the local branches crystallizes, it will prove largely instrumental in bringing about a relation between physician and pharmacist that will culminate in that mutual respect of the two professions which is so eminently desirable.

PROCEEDINGS OF THE STATE PHARMACEUTICAL ASSOCIATIONS.

The information concerning the meetings of the State Pharmaceutical Associations during the year 1906 has been obtained partly from the printed proceedings of the several Associations and partly from the reports as they were available in different pharmaceutical journals. The source of information is indicated at the conclusion of each abstract.

Alabama.—The "Silver Jubilee," or Twenty-fifth Annual Meeting of the Alabama Pharmaceutical Association, was held at Blount Springs, June 13 and 14, 1906, in three sessions. C. C. Stewart, of Greenville, was elected President; W. E. Bingham, of Tuscaloosa, Secretary. The following papers were read:

"What We Stand For," by H. A. Clotworthy, representative of the N. A. R. D.

"The Labor Question," by James W. Milner.

"Relations that Should Exist Between the Pharmacist and the Physician," by W. E. Cox.

"The Ethical Relations that Should Exist Between the Wholesaler and the Retailer," by L. Wharton.

"Why it is Profitable to Order Sufficiently in Advance to Overcome Delays in Transit," by W. E. Bingham.

"Contribution to Historical Pharmacy," by P. C. Candidus.

The Association adjourned to meet at Blount Springs on the second Wednesday in June, 1907. (*From Proceedings.*)

Arkansas.—The Twenty-fourth Annual Meeting of the Arkansas Association of Pharmacists was held at Hot Springs, May 8–10, 1906, in — sessions. Forty new members were added to the roll. W. H. Skinner, of Pochahontas, was elected President; Mary A. Fein, of Little Rock, Secretary. (*From Merck's Report, July, 1906.*)

Colorado.—The Seventeenth Annual Meeting of the Colorado Pharmaceutical Association was held at Talmar Lake, June 19–21, 1906, in several sessions. T. L. Steadman, of Denver, was elected President; Charles E. Ward, of Denver, Secretary. Several interesting addresses were made on various topics of interest. The following paper was read: "Should a Drug Store Always Have a Registered Man in Charge?" by T. L. Steadman.

The Association adjourned to meet at Glenwood Springs in 1907.

—(*From Western Druggist, Aug. 1906.*)

Connecticut.—The Thirtieth Annual Meeting of the Connecticut Pharmaceutical Association was held at New London, June 20 and 21, 1906, in — sessions. J. D. Hartigan, of Bridgeport, was elected President; Charles A. Rapelye, of Hartford, Secretary. "The weather being warm and the amount of pressing business not large, the members devoted much time to the fine entertainments provided by the local committee."

—(*From Druggist's Circular, July, 1906.*)

Georgia.—The Thirty-first Annual Meeting of the Georgia Pharmaceutical Association was held at Atlanta, May 22 and 23, 1906, in three sessions. W. B. Freeman, of Atlanta, was elected President; Max Morris, of Macon, Secretary. The following papers were read:—

"Read Your Policies," by Mr. Malone (Fire Adjuster).

"The Eighth Decennial Revision of the U. S. P.," by George F. Payne.

Among other interesting transactions, the most notable is the adoption of a resolution endorsing the uniform conference of the degree of "Doctor of Pharmacy" upon graduates of Colleges of Pharmacy. The Association adjourned to meet at Savannah, 1907. (*From Proceedings.*)

Illinois.—The Twenty-seventh Annual Meeting of the Illinois Pharmaceutical Association was held at Peoria, June 19–21, 1906, in three sessions. H. C. Porter, of Rockford, was elected President; W. B. Day, of Chicago, Secretary. The following papers were read:

"Social Hygiene," by W. Bodemann.

"Drug Store Accommodations," by Otto E. F. Bruder.

"How Can the Illinois Pharmaceutical Association Be Made More Useful to the Retail Druggist and How Can He Be Persuaded to Give It His Support?" (prize essay), three papers, by Henry F. Schaper, Thos. Rixleben and Otto E. F. Bruder.

The Association adjourned to meet at Galesburg in 1907.

—(*From Proceedings.*)

Indiana.—The "Jubilee Meeting," or Twenty-fifth Annual Convention of the Indiana Pharmaceutical Association was held at Indianapolis, June 26–28, 1906, in seven sessions. Bruno Knoefel, of New Albany, was elected President; A. Timberlake, of Indianapolis, Secretary. The following papers were read:

"Random Notes," by Leo Eliel.

"Business Cheer," by Charles Genolin.

"Cannabis Indica," by W. J. Walters.

"Adulteration of Olive Oil," by Harry E. Rickel and Edward Kurz.

"Some Remarks on the U. S. P. Method for Opium Assay," by Leo Eliel.

"Purity of Acetic Acid," by Wayne T. Miller.

The Association adjourned to meet at Evansville, during the summer of 1907. (*From Proceedings.*)

Indian Territory.—The Twelfth Annual Meeting of the Indian Territory Pharmaceutical Association was held at Sulphur, May 22–24, 1906, in — sessions. Sixty new members were elected. John D. Humphrey, of Bristow, was elected President; H. D. Kniseley, of Checotah, Secretary and Treasurer. "The local druggists saved no labor or expense to give their visiting brethren a good time" (*From Merck's Report, July, 1906.*)

Iowa.—The Twenty-seventh Annual Meeting of the Iowa Pharmaceutical Association was held at Cedar Rapids, July 10–12, 1906, in three sessions. George M. Pedersen, of Harlan, was elected President; J. M. Lindly, of Winfield, Secretary. The following papers were read:

"Purity, Rather than Price, the Prime Consideration" (prize essay), four papers, by H. Hansen, Miss Zada M. Cooper, E. B. Tainter and C. E. Frost.

"Developing a Prescription Business" (prize essay), four papers, by H. Hansen, W. F. Junger, P. H. Junger and Richard Gerlach.

"Formula on the Bottle, Why Should the Druggist and the People Demand It?" (prize essay), four papers, by Miss Zada M. Cooper, H. Hansen, E. B. Tainter and W. J. Junger.

"Impositions of Manufacturers upon Druggists; What is the Druggist to Do?" (prize essay), four papers, by W. F. Junger, P. H. Junger, E. B. Tainter and Richard Gerlach.

"The Rational Treatment of the Medicine Wagon" (prize essay), four papers, by I. W. Clements, E. B. Tainter, W. F. Junger and Richard Gerlach.

"Pharmacists' Counter-Prescribing versus Physicians' Dispensing; How can we Overcome the Evil?" (prize essay), four papers, by E. B. Tainter, I. W. Clements, Miss Blanche M. Carrigg and H. Hansen.

"How can Pharmacists' Wives Prove Themselves of Assistance to Our Profession?" (prize essay), four papers, by Miss Daisy A. Frick, Mrs. W. A. Fish, Mrs. W. F. Junger and Mrs. Fletcher Howard.

"The Ideal Pharmacist" (prize essay), by Miss Zada M. Cooper.

"The Popular Drug Store" (prize essay), by Miss Blanche M. Carrigg.

"The American Pharmaceutical Convention at Atlantic City" (prize essay), by Mrs. Fletcher Howard.

"The Drug Store Loafer" (prize essay), by Miss Clara E. Junger.

The Association adjourned to meet at Clinton, July 9-11, 1907.

—(*From Proceedings.*)

Kansas.—The Twenty-seventh Annual Meeting of the Kansas Pharmaceutical Association was held at Emporia, May 22-24, 1906, in five sessions. M. W. Friedenbarg, of Winfield, was elected President; A. E. Topping, of Overbrook, Secretary. The following papers were read:

"A Square Deal to Candidates for Registration in Pharmacy," by J. F. Tilford.

"How Can the Pharmacist Best Meet the Popular Demand for Legislative Control of Adulterations?" by——?

"Pharmacists and Legislation," by R. H. Needham.

"Cultivation of Medicinal Plants," by L. E. Sayre.

"Soap Liniment and How it is Made," by L. D. Havenhill.

The Association adjourned to meet at Kansas City "in Kansas," May 21-23, 1907. (*From Proceedings.*)

Kentucky.—The Twenty-ninth Annual Meeting of the Kentucky Pharmaceutical Association was held at Cerulean Springs, June 19-21, 1906, in three sessions. R. L. Moorman, of Litchfield, was elected president; J. W. Gayle, of Frankford, Secretary. The following papers were read:

"Local Druggists' Association," by Simon N. Jones.

"Counter Remedies; What Lines are Best to Carry?" by W. H. Watson.

"Anti-Narcotic Law and its Defects," by Addison Dimmitt.

"Patent Medicines." Two papers: by Simon N. Jones and Herman H. Koegel.

"Relationship Between Physician and Druggist." Three papers: by C. S. Porter, Herman H. Koegel, and Simon N. Jones.

"For the Good of Our Business," by Wm. H. Tibbals.

"Medicinal Plants of Kentucky," by Gordon L. Curry.

"Honestly, if You Married Again, Would You Marry a Druggist?" Two papers: by Mrs. J. W. Gayle and Mrs. C. A. Leathers.

"The Use of Cosmetics; Does it Improve on Nature?" by Mrs. W. H. Watson.

The Association adjourned to meet at Olympian Springs, June, 1907.

—(*From Proceedings.*)

Maine.—The Thirty-ninth Annual Meeting of the Maine Pharmaceutical Association was held at Rangeley Lake, June 19-21, 1906, in two sessions. John Williamson, of Portland, was elected President; M. L. Porter, of Danforth, Secretary. The usual reports were presented and discussed, but there were no special papers read at this meeting, which was well attended.

Time and place of annual meeting in 1907, not mentioned. (See New Hampshire.) (*From Proceedings.*)

Maryland.—The Twenty-fourth Annual Meeting of the Maryland Pharmaceutical Association was held at Braddock Heights, June 19–21, 1906, in four sessions. J. Edwin Hengst, of Baltimore, was elected President; Owen C. Smith, of Baltimore, Secretary. The following papers were read:

"Why the Doctorate Degree Should be Settled Upon in Pharmacy," by Henry P. Hynson.

"Formaldehyde as a Gaseous Disinfectant," by Daniel Base.

"The Preparation of Attar of Rose," by J. C. Wolf.

"An Extinguishing Agent for Mercury," by H. A. B. Dunning.

"Pharmacy in France and England," by Dr. A. R. L. Dohme.

"Granular Effervescent Salts," by J. J. Barnett.

"The U. S. P. Granular Effervescent Salts," by Wm. J. Lowry, Jr.

The Association adjourned to meet at Baltimore in 1907.

—(*From Proceedings.*)

Massachusetts.—The Twenty-fifth Annual Meeting of the Massachusetts State Pharmaceutical Association was held at Magnolia, June 19–21, 1906, in four sessions. P. B. Moriarty, of Worcester, was elected President; James F. Guerin, of Worcester, Permanent Secretary. The following papers were read:

"Notes on the Adulteration Law," by William W. Bartlet.

"Spirit of Nitrous Ether; its Manufacture and Assay," by Willis St. L. Furbush.

The Association adjourned to meet again at Magnolia in 1907.

—(*From Proceedings.*)

Michigan.—The Twenty-fourth Annual Meeting of the Michigan State Pharmaceutical Association was held at Jackson, August 14 and 15, 1906, in three sessions. John L. Wallace, of Kalamazoo, was elected President; E. E. Calkins, of Ann Arbor, Secretary. The following papers were read:

"Advertising a Neighborhood Store." Three papers: by Minor E. Keyes, C. H. Frantz and Owen Raymo.

"Poisonous Species of Rhus," by A. B. Stevens.

"Showing Goods—Outside," by H. B. Hoffman.

"Showing Goods Inside of a Drug Store," by J. L. Wallace.

"Emergency Treatment by Pharmacists," by Frederick R. Waldron.

"What are Physicians Prescribing?" by W. A. Hall.

"The Attitude of the Pharmaceutical Profession in Kansas Toward the Adulteration of Drugs and Medicines." by L. E. Sayre.

"The Drug Trade of Argentina," by Fred. C. Arner.

"Pharmacopœial Criticisms," by Prof. A. B. Stevens.

"Waste in the Drug Business," by Arthur H. Webber.

"Some Adulterated Drugs Found in Alabama," by W. H. Blome.

The time and place of next annual meeting (1907) is to be determined by the Executive Committee.

—(*From Proceedings.*)

Minnesota.—The Twenty-second Annual Meeting of the Minnesota State Pharmaceutical Association was held at Tonka Bay (Lake Minnetonka), June 26–28, 1906, in six sessions. H. W. Rietzke, of St. Paul, was elected President; Theo. F. Leeb, of Winona, Secretary. The following papers were read:

“Prerequisite Education,” by W. A. Frost.

“Knowledge and Ability,” by A. J. Eckstein.

“Some Observations of a Retailer,” by A. D. Thompson.

“Pharmacy—The Ideal *vs.* the Real,” by Chas. W. Drew.

“College Education a Necessity for the Pharmacist of the Future,” by John Nielson.

“The Ethical Conscience of Pharmacy,” by Dr. Richard O. Beard.

“The Pharmacist as a Medical Specialist,” by Dean F. J. Wulling.

“The College of Pharmacy, University of Minnesota”—Historical—continued from 1905, by Dean F. J. Wulling.

The Association adjourned to meet at White Bear Lake in 1907.

—(*From Proceedings.*)

Mississippi.—The Fourth Annual Meeting of the Mississippi State Pharmaceutical Association was held at Crystal Springs, July 23 and 24, 1906, in two sessions. B. L. Clarke, of Kosciusko City, was elected President; O. W. Bethea, of Meridian, Secretary. The following papers were read:

“Advertising a Retail Drug Store,” by B. L. Clarke.

“Should the Pharmacist Make His Own Preparations?” by E. G. Beard.

The Association adjourned to meet at Gulfport during the session of the Gulfport Chautauqua in 1907. (*From Proceedings.*)

Missouri.—The Twenty-eighth Annual Meeting of the Missouri Pharmaceutical Association was held at Pertle Springs, June 12–15, 1906, in — sessions. L. A. Seitz, of St. Louis, was elected President; Dr. H. M. Whelpley, of St. Louis, was elected Permanent Secretary. The following papers were read:

“Anglo-Saxon Medicine,” by J. F. Llewellyn.

“Some Prescription and Dispensing Evils,” by Francis Hemm.

“The Polariscope and the Pharmacopœia,” by Dr. H. M. Whelpley.

“Memory Helps,” by A. Brandenberger.

“Microscopical Examination of Powdered Drugs,” by Dr. H. M. Whelpley.

“The Drug Clerk,” by F. R. Dimmitt.

“A Few Points of Interest for Retail Pharmacists,” by O. F. Claus.

“Small Things on the Prescription Case,” by A. Brandenberger.

“The First Pharmacopœia in the United States,” by Dr. H. M. Whelpley.

“How Can the Abuses to Which the Free Use of the Telephone Subjects Us be Remedied?” by H. C. A. Huegel.

"Odd Ideas by Two Old-Timers," by J. Griffiths and C. E. Corcoran.

"The Called and Regular Missouri Pharmaceutical Association Meetings of 1881," by Dr. H. M. Whelpley.

"Some Interesting Prescriptions," by Francis Hemm.

"Recognition of Drugs by the Aid of a Simple Microscope," by Dr. H. M. Whelpley.

"How to make a Drug Store Pay," by W. H. Lamont.

"Sketch of the Early History of the Missouri Pharmaceutical Association," by Dr. R. T. Miller.

The Association adjourned to meet at Pertle Springs (Warrensburg), June 11-15, 1907. (*From Proceedings.*)

Montana.—The ——— Annual Meeting of the Montana State Pharmacists' Association was held at Butte during the first week in October, 1906, "and much important business was transacted." Lewis Drebelbis, of Butte, was elected President; E. A. Houser, of Butte, Secretary.

The Association adjourned to meet at Butte in 1907.

(*From Western Druggist, November, 1906.*)

Nebraska.—The Twenty-fifth Annual Meeting of the Nebraska State Pharmaceutical Association was held at Hastings, June 5-7, 1906, in — sessions. One hundred new members were elected. E. H. Dort, of Auburn, was elected President, O. H. Bauman, of Grand Island, Secretary.

The Association adjourned to meet at Seward in 1907.

(*From Western Druggist, July, 1906.*)

New Hampshire.—The Thirty-third Annual Meeting of the New Hampshire Pharmaceutical Association was held at Manchester, June 26 and 27, 1906, in two sessions. Lewis G. Gilman, of Manchester, was elected President; Herbert E. Rice, of Nashua, Secretary. The usual reports were presented, discussed and disposed of. No other papers were presented. The meeting was well attended and enjoyed by all present.

The Association adjourned to meet at Magnolia, Mass., jointly with the Maine, Vermont, Rhode Island, Connecticut and Massachusetts Associations, on invitation and as guests of the last-named Association, June 19-21, 1907. (*From Proceedings.*)

New Jersey.—The Thirty-sixth Annual Meeting of the New Jersey Pharmaceutical Association was held at Atlantic City, June 6-8, 1906, in four sessions. P. E. Hommel, of Jersey City, was elected President; Frank C. Stutzlen, of Elizabeth, Secretary. The following paper was read:

"What should be the Proper Attitude of the State Pharmaceutical Association Toward Legislation Destined to Control the Sale of Proprietary Medicines?" by George M. Beringer.

"Oleoresin of Cubebs," by Charles H. La Wall.

"A Tasteless, Transparent Preparation of Castor Oil," by P. E. Hommel.

"Defects in Collegiate Education as Exhibited in the Examination Before the State Board of Pharmacy," by George H. White.

"Contributions for the Chemical Laboratory," by August Drescher.

"N. A. R. D. Movement has not been of any Real Benefit to Professional Pharmacy," by George M. Beringer.

"Are the Official Elixirs Satisfactory," by P. E. Hommel.

"Criticisms of Some U. S. Preparations," by P. E. Hommel.

The Association adjourned to meet at Asbury Park in 1907.

—(*From Proceedings*).

New York.—The Twenty-eighth Annual Meeting of the New York State Pharmaceutical Association was held at Niagara Falls, June 26-29, 1906, in four Sessions. Frederick L. Rogers, of Middletown, was elected President; E. S. Dawson, Jr., of Syracuse, Secretary. T. J. Keenan presented, as in past years, a comprehensive report on new remedies. The following papers were read:

"Apathy and Legislation," by J. B. Todd.

"Where Does the \$2.00 Go?" by J. B. Todd.

"Cataplasma Kaolini," by Dr. A. Herzfeld.

"The Military Pharmacist—A Lesson from the Orient," by C. A. Mayo.

"Druggist's Liability Insurance," by Hugo Kantrowitz.

"Headache Powders," by Dr. Herzfeld.

"Shall Practical Training Succeed or Precede College Education?" by E. C. Goetting.

"What is the Best Pharmaceutical Library," by Dr. A. I. Cohn.

"Inconsistencies in Our Code of Ethics," by David Strang.

The Association adjourned to meet in the Columbian Hotel, Wells Island, one of the "Thousand Islands," in 1907.

—(*From Druggist's Circular, July, 1906*).

North Carolina.—The Twenty-seventh Annual Meeting of the North Carolina Pharmaceutical Association was held at Wrightsville Beach, June 14 and 15, 1906, in four sessions. C. A. Raysor, of Asheville, was elected President; T. W. Vaughan, Durham, Secretary. The following papers were read:

"Profits—And How to Increase Them," by Charles R. Thomas.

"Benefits Wrought by the N. A. R. D.," by Wm. Niestlie.

—(*From Proceedings*).

North Dakota. The Twenty-first Annual Meeting of the North Dakota Pharmaceutical Association was held at Grand Forks, August 7-9, 1906, in — Sessions. Thos. W. Fotheringham, of West Hope, was elected President; W. S. Parker, of Lisbon, Secretary-Treasurer.

—(*From Merck's Report, September, 1906*).

Ohio.—The Twenty-eighth Annual Meeting of the Ohio State Pharmaceutical Association was held at Cedar Point, June 26-29, 1906, in three sessions. A. H. Dean, of Waverly, was elected President; Theo. D. Wetterstroem, of Cincinnati, Permanent Secretary. The following papers were read:

"The Drug Trade in Cincinnati Before 1820," by Joseph Feil.

"Formula for Compound Resorcin Ointment," by E. A. Schellentrager and Otto E. Muhlau.

"A Woman's Way of Advertising and Selling Seasonable Articles," by Mary R. Hamilton.

"Percentage of Alcohol Remaining in Fluidextract of Cascara Sagrada," by Joseph Feil.

"Soda Water or other Side Lines, How to Make them Profitable," by Paul A. Loesser.

"Why Cannot Drug Stores Close on Sunday?" by William F. Kaemmerer.

"The Preparations of the New Pharmacopœia," by H. V. Army.

"A Few Prescription Difficulties," by William F. Kaemmerer.

"The O. S. P. A. Auxiliary," by J. H. Beal.

The Association adjourned to meet at Cedar Point, July 9-11, 1907.

—(*From Proceedings.*)

Oklahoma.—The Seventeenth Annual Meeting of the Oklahoma Pharmaceutical Association was held at Guthrie, May 9-11, 1906, in — sessions. Robert M. Scott, of Oklahoma City, was elected President; F. M. Weaver, of Oklahoma City, Secretary. The following papers were read:

"Should the Druggists of the State of Oklahoma have the Right to Sell Liquors for Medicinal, Mechanical and Scientific Purposes?" by Winfield S. Samuel.

"Purity Rather Than Price the Prime Consideration," three papers, by Vernon A. Pendleton, J. S. Moore and W. S. Samuel.

"Alkaloid Extraction," by Prof. L. E. Sayre.

"Suggestions for Our Pharmacy Law when we get Statehood," by W. Scott Samuel.

"The Sale of Liquor by Druggists," by Chas. A. Dow.

"The Clerk from the Proprietor's Point of View," by L. Mathews.

"How I Started the First Drug Store in Oklahoma," by C. A. Wickmiller.

"Suggestions for the New State Pharmacy Law," by Miss Effie Stone.

"The Pharmacopœia," by Dr. H. M. Whelpley.

The Association adjourned to meet in 1907, time and place to be determined by a committee appointed for the purpose.

—(*From Proceedings.*)

Oregon.—The ——— Annual Meeting of the Oregon Pharmaceutical Association was held at Newport (date not given—Rep.) in 1906. J. M. A. Lane, of Portland, was elected President; A. W. Allen, of Portland, Secretary. (*From Merck's Report, September, 1906.*)

Pennsylvania.—The Twenty-ninth Annual Meeting of the Pennsylvania Pharmaceutical Association was held at Glen Summit Springs Hotel, June

26-28, 1906, in seven sessions. George A. Gorgas, of Harrisburg, was elected President; Jacob A. Miller, of Harrisburg, Secretary. The following papers were read:

"The Procter Memorial," by Henry Kraemer.

"On Tooth Paste," by H. C. Blair.

"Simple Elixir as a Vehicle in Prescriptions Intended for Children," by Edgar E. Heffner.

"Tinctures from Fluid Extracts," by Isaac M. Weills.

"Some Improved Formulæ," by P. H. Utech.

"The Sale of Cigars by Pharmacists," by J. B. Moore.

"Is it True That the United States Pharmacopœia, Eighth Revision, is More of a Manufacturer's Handbook Than a Pharmacist's Guide?" by Joseph P. Remington.

"Doses in the U. S. Pharmacopœia of 1900," by C. B. Lowe.

"Laboratory Notes," by Charles E. Vanderkleed.

"A Digest of Digestive Ferments," by Franklin M. Apple.

"A New Method of Making Granular Effervescent Salts," by J. Percy Remington.

"Physician and Pharmacopœia," by B. E. Pritchard.

"The Preparation of Thymol Iodide," by Frank E. Niece.

"Laboratory Notes," by William Graham.

"Notes on the Alkaloidal Assay Processes of the New Pharmacopœia," by Frank X. Moerk.

"Some Novelties in Analytic Methods," by Henry Leffman.

"Are Show Windows an Advantage in Suburban Sections?" by Wm. G. Greenawalt.

"Some Notes on the Detection and Estimation of Boric Acid," by Charles H. LaWall.

"Artificial Fruit Essences," by Willard Graham.

"Has Not the Pharmacist Sold His Birthright for a Mess of Pottage?" four papers in reply to query, by W. O. Frailey, J. Leyden White, George M. Beringer and J. F. Patton.

"Present Status of Patent Medicines," by B. E. Pritchard.

"Patent Medicine Agents or Prescription Compounders—Which?" by F. M. Apple.

"Attitude of the Pharmacist toward the Crusade Against Patent Medicines," by John R. Thompson.

"Popularizing Standard Preparations," by M. I. Wilbert.

"The Preparation of Tasteless Castor-oil," by J. B. Moore.

"Our Future Pharmacists," by F. M. Siggins.

"Effervescent Solution Citrate Magnesia," by F. S. Nagle.

"What is the Most Effective Method of Advertising for the Retail Druggist?" by L. E. Hastings.

"Does the Soda Fountain Pay?" by James S. Gleghorn.

"How the N. A. R. D. Has Benefited the Retail Druggist," by T. H. Potts.

The Association adjourned to meet in Bedford Springs Hotel, Bedford, June 18-20, 1907. (*From Proceedings.*)

Rhode Island.—The Rhode Island Pharmaceutical Association was entertained by the Virginia Pharmaceutical Association at the Hotel Gladstone, at Narragansett Pier, July 10-12, 1906, a courtesy extended to reciprocate a similar event at the same place in 1905, when the Virginia Association accepted the hospitality of the Rhode Island Association.

The Thirtieth Annual Meeting of the Association was held at Providence, January 9, 1906, in one session. J. E. Goff, of Providence, was elected President; C. H. Daggett, of Providence, Secretary.

The Association adjourned to meet in joint session with the New England State Association at Magnolia, Mass., during the summer of 1907.

—(*From Western Druggist, August, 1906, and Druggists' Circular, February, 1907.*)

South Carolina.—The Thirtieth Annual Meeting of the South Carolina Pharmaceutical Association was held at Greenville, August 8 and 9, 1906, in three sessions. C. A. Milford, of Abbeville, was elected President; F. M. Smith, of Charleston, Secretary and Treasurer. A number of papers were read (titles not ascertained—Rep.).

The Association adjourned to meet at the Isle of Palms in 1907.

—(*From Druggists' Circular, September, 1906.*)

Tennessee.—The Twenty-first Annual Meeting of the Tennessee Pharmaceutical Association was held at Lookout Mountain, July 17-19, 1906, in six sessions. Dan Lanehan, of Monteagle, was elected President; E. F. Trolinger, of Nashville, Secretary. The following papers were read:

"What are the Best Methods of Advertising that can be Adopted by the Retail Druggist?" by J. E. Moran.

"How to Select Chemicals for the Prescription Case," by S. C. Davis.

"Methods for the Prevention of Errors in Filling Prescriptions," by H. W. McDonald.

"The Advantage of a College Education," by D. H. Neil.

"The Value of Membership in the State and National Association of Retail Druggists," by E. F. Trolinger.

"Standardization of Drugs," by D. H. Neil.

"How to Train a Husband," by Mrs. W. F. Summers.

The Association adjourned to meet at Monteagle the third Tuesday in July, 1907. (*From Proceedings.*)

Texas.—The Twenty-seventh Annual Meeting of the Texas State Pharmaceutical Association was held at Mineral Wells, June 19-21, 1906, in four sessions. J. T. Coulson, of Corsicana, was elected President; R. H. Walker, of Gonzales, Secretary-Treasurer. The following papers were read:

"The Relation of the Physician and Pharmacist to the Pharmacopœia and National Formulary," by E. G. Eberle.

"The Pharmacist and the Machine," by Kirk D. Holland.

"Practical Pharmacy," by R. R. D. Cline.

"Advertising that Pays," by J. P. Hayter.

"Advertising the Store," by W. D. Adams.

"Liquor Magnesiae Citratis," by L. M. Whitsett.

"The Relation of Reciprocal Registration to the Pharmacist," by O. L. Ferrell.

"How to Manage a Drug Store in a Small Town," by J. Wesley Young.

"Tanret's and Esbach's Reagents for the Determination of Albumin in Urine and their Limitation," by John Pfeiffer.

"The Texas State Pharmaceutical Association" (poem), by W. H. Cousins.

"History of Pharmacy in Texas," by E. G. Eberle.

The Association adjourned to meet at San Antonio in 1907.

—(*From Proceedings*).

Utah.—The Sixth Annual Meeting of the Utah Pharmaceutical Association was held at Ogden, August 14 and 15, 1906, the membership being increased to one hundred and fifty. S. W. Badcon, of Ogden, was elected President; J. H. Johnson, of Salt Lake, was elected Secretary. The following papers were read:

"Cut Rate Druggists," by H. A. Knowles.

"The Main End of the Drug Business," by J. L. Franklin.

"Drug Work," by Alexander Headquist.

"The Physician and the Druggist," by Dr. W. A. Wade.

—(*From Druggists' Circular, September, 1906.*)

Vermont.—The Thirteenth Annual Meeting of the Vermont State Pharmaceutical Association was held in Burlington, July 11 and 12, 1906, in two sessions. Chas. F. Bigelow, of Newport, was elected President; W. E. Terril, of Montpelier, Secretary. The business transacted was mainly of a routine character, but the meeting was well attended as may be inferred from the presence of one hundred and ninety-eight members, ladies and guests who took part in an excursion which closed the meeting. The association adjourned to meet with the two other New England Associations, as the guests of the Massachusetts Pharmaceutical Association, at Magnolia, Massachusetts, in 1907. (*From Proceedings.*)

Virginia.—The Twenty-fifth Annual Meeting of the Virginia Pharmaceutical Association was held at sea, en-route to Narragansett Pier, and at that resort, June 10-12, 1906 — the business sessions being held on board the boat. E. C. Hamner, of Lynchburg, was elected President, and C. B. Fleet, of Lynchburg, Secretary. At the Pier the Association entertained the Rhode Island Pharmaceutical Association, thus reciprocating.

ing a similar entertainment given the year before at the same place by the Rhode Island pharmacists to those of Virginia.

—(*From Western Druggist, August, 1906.*)

Washington.—The Seventeenth Annual Meeting of the Washington Pharmaceutical Association was held at Tacoma, July 9–11, 1906, every section of the state being represented. L. L. Tallman, of Walla Walla, was elected President, and W. P. Bonney, of Tacoma, Secretary.

—(*From Western Druggist, August, 1906.*)

West Virginia.—The West Virginia Pharmaceutical Association was organized at Parkersburg, October 16 and 17, 1906, some fifty druggists, representing every town of any size in the State, assisting in the organization. Alfred Walker, of Sutton, was elected President; S. Arch Kreig, of Charleston, Secretary. After the adoption of a constitution and by-laws the organization was perfected by the appointment of the usual committees, to whom the affairs of the Association are entrusted. One of the interesting features was the reading of a paper on "Organization," by Professor Beal, of Scio, Ohio.

—(*From Western Druggist, November, 1906.*)

Wisconsin.—The Twenty-sixth Annual Meeting of the Wisconsin Pharmaceutical Association was held at Appleton, August 7–9, 1906, in — sessions. A. A. Du Mez, of Cashton, was elected President; Henry Rollman, of Chilton, Secretary. The following papers were read:

"On Mutual Retail Druggists' Fire Insurance," by W. F. Kaiser.

"Concerning Druggists and Traveling Salesmen," by Edward Williams.

"The Best Method of Increasing the Profits in the Retail Drug Business," by A. R. Eberle.

"How to Work for the Best Interests of Your Employer," by Chas. Sheblak.

"Hints on Advertising," by W. J. Boulet.

"Cigars as a Side Line for Druggists," by E. Dietz.

The Association adjourned to meet in 1907 on board of a steamer on Lake Michigan, the date of the trip to be determined by the Executive Committee. (*From Proceedings.*)

PHARMACY.

A. APPARATUS AND MANIPULATIONS.

Analytical Weights—Practical Suggestions for Correction.—Dr. O. v. Spindler calls attention to the difference in the absolute ponderable value of weights of precision due to differences in the specific gravity of the

material of which the weight is constructed and the consequent difference in the volume of air displaced by weights of apparently identical value. Thus, if a 100 Gm. weight of brass, of sp. gr. 8.0, is placed on each of the pans of an analytical balance, the beam will maintain its equilibrium; but if one of the brass weights is replaced by a 100 Gm. weight of platinum, sp. gr. 21.0, the scale pan containing the latter will sink, because of the resistance of the air which, in accordance with the Archimedean law, is in proportion to the volume of the two weights and consequently is greater in the case of the brass weight, having the larger volume, than in that of the platinum weight, having the smaller volume; and this difference becomes still greater in the case of weights of quartz (sp. gr. 2.4) which have recently been introduced into use. The author shows that these differences, although they can be ignored in the large majority of analytical weighings, are nevertheless sufficiently large to become important in analyses in which absolute weight not relative changes in weight are concerned. He calculates that 100 Gm. of platinum occupy a volume of 5 Cc., of brass 12 Cc. and of quartz 40 Cc.; and since 1 Cc. of air represents a resistance equal to 0.0012 Mgm., these figures represent respectively 6, 14.4 and 48 Mgm. Consequently, taking the platinum weight as the normal, the brass weight would appear too light by 8.4 Mgm., and the quartz weight by even 42 Mgm. The practical suggestion made by the author consists in the construction of all the larger weights of brass (either gilded or platinized), sp. gr. 8.4; weights from 0.5 to 0.01, of platinum, sp. gr. 21.1; and weights from 0.005 to 0.001, of *aluminum*, which has practically the same sp. gr. as quartz (2.6). The calculation for the necessary corrections may then be made in accordance with the data above given, for which purpose the author has constructed and submits a convenient table.—Schweiz. Wschr. f. Chem. u. Pharm, xlv, No. 30 (1906), 489.

Specific Gravity—Practical Apparatus for Small Quantities of Liquids.
—F. H. Alcock suggests the following simple method and apparatus for determining the specific gravity of liquids too small in quantity for the use of the ordinary pycnometer, and finds it sufficiently accurate for the purposes of the busy pharmacist: Take a piece of glass tube of $\frac{1}{4}$ inch internal diameter, and draw out two capillaries about 2 inches on each side of a length to suit the quantity of liquid to be tested. Fill the tube by suction, using a very narrow piece of india-rubber tubing. Owing to the narrowness of each of the ends it can be placed in a pan of the balance quite flat without fear of much loss either by spilling or evaporation. Actual example of a sample of oil of peppermint:

Tube weight,	0.833 Gm.
Tube weight + water.....	1.171 Gm.
Tube weight + oil	1.139 Gm.
∴ Specific gravity, 60° F.	0.9053

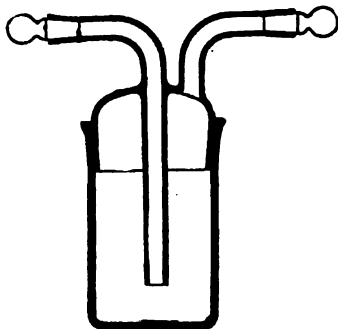
Subsequently a bulk sample of the same was received, and this gave, by the pycnometer of 25 Cc. capacity, a specific gravity of 0.90528.—*Pharm. Journ.*, Jan. 5, 1907, 6.

Weighing Bottles—New Forms.—L. F. Guttman has devised the weighing bottle shown by Figs. 1 and 2. The advantages of the weighing bottle, Fig. 1, are provided by the light cap stopper ground on the outside, and are various. Thus in weighing by difference nothing can stick to the ground surface, and hence second portions can be weighed out successively without the ground joint having to be cleaned, as is necessary with the ordinary form of stopper. This is of particular advantage in the case of hygroscopic substances, and also prevents the stopper from sticking

FIG. 1.



FIG. 2.



Weighing Bottles.

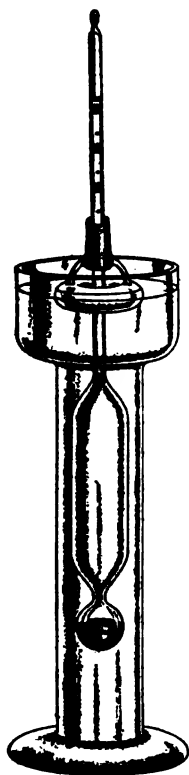
When weighing a filter, this can project up to the top of the weighing-bottle and completely fill it. Further no dust can accumulate between the ground surfaces, and the bottle is easily wiped clean.

The second kind of weighing-bottle (Fig. 2) is of use in drying substances to constant weight in a current of gas, or in determining water of crystallization, etc. The bottle is heated to the desired temperature in a small air-bath formed of a large porcelain crucible covered with a piece of asbestos board suitably perforated, and a current of dry gas, if necessary, hydrogen or nitrogen, is passed through. The bottle may then be closed tightly by the little stoppers ground in the orifices of the gas entry and exit tubes.—*Merck's Rep.*, Dec., 1906, 370; from *Journ. Amer. Chem. Soc.* xxviii, 1667.

Hydrometer—A New Form Designed for Accurate Readings.—A. Balfour describes an improvement in hydrometers which permits of more accurate reading than is possible with hydrometers of ordinary construction. The hydrometer in use is shown by Fig. 3. It consists of an ordinary form of hydrometer provided with a floating index, which is used in

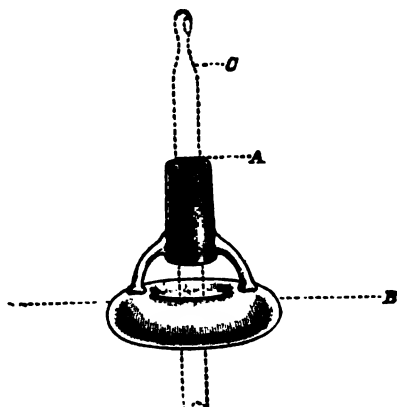
the graduation of the instrument, the reading being made, not at the surface of the liquid, but at the point where the top of the float cuts the stem of the hydrometer. This float, which is shown by Figs. 4 and 5 in perspective and in cross-section, consists of a hollow ring of glass supporting an upright short section of amber-colored tubing, cut off at a slight angle, the uppermost portion of the tube being used as the index as shown at *A* (*a*) in the cuts, the level of the liquid being indicated at *B* (*b*), while

FIG. 3.



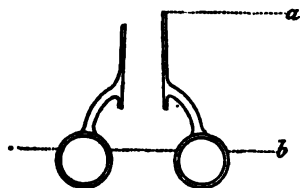
Complete Hydrometer.

FIG. 4.



Floating Index Showing Method of Reading.

FIG. 5.



Cross Section of Floating Index.

C in Fig. 4 is the stem of the hydrometer. In use it is essential that the stem remain dry; wetting of the stem being avoided if the float is rested on the bulb before immersing the hydrometer in the liquid, and then effecting the immersion gradually. When removing the hydrometer the float should be taken out first, in order to keep the tube dry. Obviously, the readings with the aid of this index are not only more accurate but are independent of the influences of capillarity, opaqueness, or want of trans-

parency.—Merck's Rep., Feb., 1907, 51; from Rep. Wellcome Research Laboratory, 1906, 241.

Thermometers—Origin of the Fahrenheit Scale.—The "Western Druggist" prints the following information concerning the origin of the Fahrenheit scale for thermometers: Sir Isaac Newton, who invented the thermometer, conceived the idea of making the starting point of the scale 12, which number he made a unit to express the heat of the human body. He divided the space on his scale into twelve points between the freezing point and the heat of the human body. Newton rated the boiling point of water at 30, as he reckoned that the temperature of boiling water was about thrice that of the human body. The whole scale was devised to represent the range between the freezing point and the normal temperature of a healthy human being. The original thermometer invented by Newton consisted of a glass tube with an internal diameter of one-eighth of an inch, which was filled with Calcutta linseed oil. Fahrenheit took up the subject where Newton left off, and divided each degree that Newton had marked on the scale into two parts, and so made the measure between freezing and boiling degrees twenty-four degrees instead of twelve. Fahrenheit then discovered that he could obtain a lower degree of cold than freezing by using a compound of ice and salt. Thus he marked the freezing point at eight, and fifty-three for the boiling point. But in the end, Fahrenheit decided to divide the degrees into four parts, and so made the scale as it is to-day. So that the number twelve adopted as a unit by Newton, and for no good reason whatever, is still the unit by which the Fahrenheit thermometer is governed.—West. Drugg., Dec., 1906, 707.

Bunsen Burner—New Form of Tips.—K. Lendrich recommends a new form of tips for Bunsen or Teclu burners, which have for the purpose the division of the flame into three or more parts, whereby an equable distribution of the flame is secured without diminishing its intensity. The

FIG. 6.



New Form of Burner Tips.

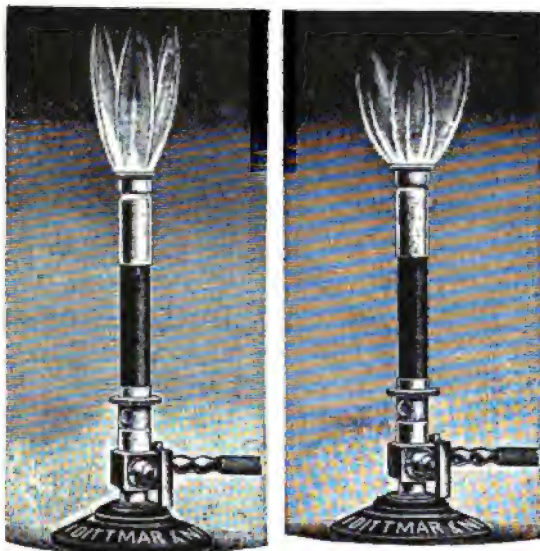
construction of these tips is shown by the accompanying cut (Fig. 6), and their effect upon the flame when fitted to the burners by Figs. 7 and 8.—Pharm. Ztg., lii (1907), No. 7, 65; from Ztschr. f. Unters. d. Nahrungsm., 1906, No. 10.

Benzin Blast Lamp—A Superior Apparatus for High Temperature

Fusions.—The use of acetylene gas having been found very destructive to platinum ware in the Wellcome Research Laboratories, A. Balfour, after several unsuccessful attempts to effect fusions of silicates, etc., by means of

FIG. 7.

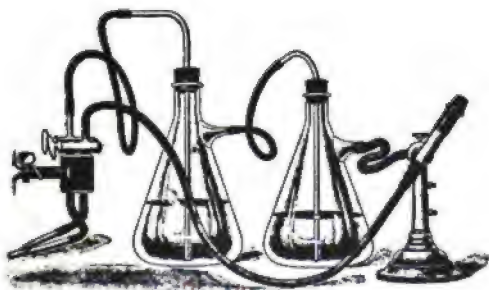
FIG. 8.



Bunsen Burner with New Form of Tips.

spirit, Bunsen's, and alcohol blast-lamps, resorted to benzin and the arrangement shown by Fig. 9. In this the blast from a Fletcher Blower is divided in two by means of a Y-tube. One of these is connected

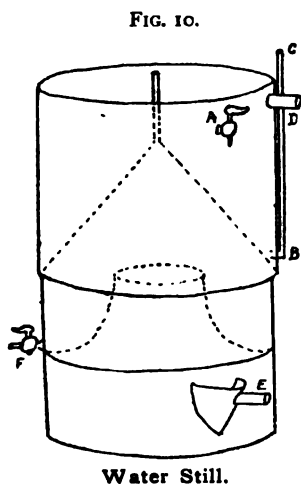
FIG. 9.



Benzin Blast Lamp.

directly with the air inlet of an ordinary blast-lamp, and the other made first to pass through one or two bottles containing benzin. Each of these

blasts is controlled by means of a stop-cock. The air-jet of the lamp should be the largest of the three usually supplied. With a little practice in adjusting the air supply, fusions may be made without difficulty. The flame has no harmful effect on platinum.—Merck's Rep. Dec., 1906, 369; from Rep. of the Wellcome Research Labor., 1906, 244.

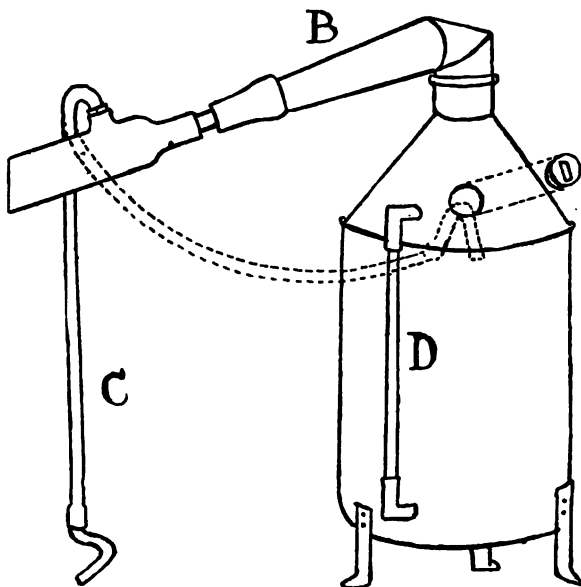


Water Still.

Water Stills—Improved Construction.

—William R. Girling describes the improved still for water shown by Fig. 10. The still, which is a modification of the one supplied as "Gem No. 1," consists of three parts and has a total height of fourteen inches, with a diameter of nine and one-half inches. The lowest portion is the boiler, provided with a "feed-cup" bearing a short piece of pipe, shown at *E*, which serves as an overflow and secures a constant level in the boiler during the distillation, warm water

FIG. 11.



Improved Water Still.

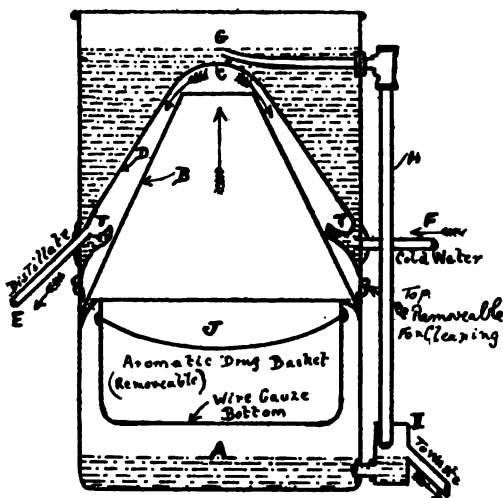
being supplied from the faucet *A* in the top section or cooling portion of

the apparatus. The cooling water passes direct from the tap, connected with a rubber tube at *C*, through *B* into the cooler, the overflow being carried off through a larger pipe at *D*, situated somewhat higher than the faucet *A*. The water, as the vapor condenses, collects in the intermediary chamber, and may be drawn off from time to time, or collected direct through the faucet *F* in a suitable receiver.

Another improved still is that recommended by Arthur W. Nunn and shown by Fig. 11. This requires little description. It consists of a still (*D*) of ordinary construction, the hood (*B*) united to a Liebig's condenser, the overflow tube (*C*) of which consists of a section of rubber tubing ending in a bent glass tube, and of such a length that it may conveniently be introduced into an opening provided in the top of the still, as indicated by the dotted outline. From time to time, as indicated by the glass gauge, water is allowed to flow through this opening which may afterwards be securely closed by means of a screw-cap. Both stills are intended for the laboratory table, with gas as the source of heat.—Pharm. Journ., Dec. 8, 1906, 625.

Gas, Oil and Steam Heated Water Stills—Economical Construction.—Ernest Brown observes that the question of distilled water is, and always

FIG. 12.



Gas, Oil and Steam Heated Water Still.

was very important with chemists, and that the ideal still should embody the following qualifications, viz.: (1) Maximum output for minimum amount of gas consumed; (2) absolute ease to clean away all deposits in boiler and on condensing surfaces; (3) action to be quite automatic; (4) to be as compact as possible; (5) the distillate to run off cool.

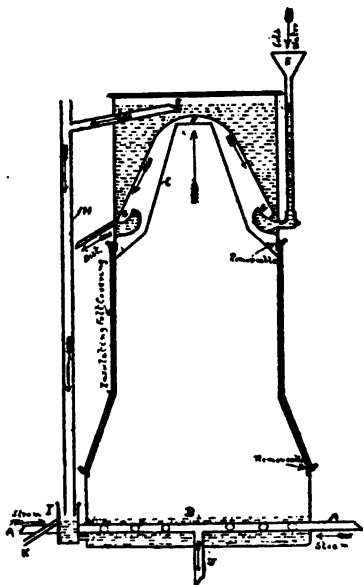
Under the advice and suggestion of Professor Greenish he has been led to make the still shown by Fig. 12, which he considers the best and most economical still embodying all the advantages mentioned. The illustration is so clear that detailed description can be omitted. It may suffice to mention that with a still measuring 14 in. high by 9 in. diameter, and a gas burner consuming 27 cubic feet of gas per hour, 6 pints (Imp. Meas., Rep.) of distilled water was obtained easily in the hour. An oil burner or stove may also act as a source of heat, while the still itself may be adapted for making various aromatic waters, as shown in the illustration by the drug basket in position.

Fig. 13, shows a steam-heated still constructed on the same lines as the one previously described, the coil (*B*) for the admission of steam, the boiler,

and top of condensing cone being easily accessible for cleaning-off purposes. With steam at 17 lbs. pressure, a still of this kind (size not stated) produced $4\frac{1}{4}$ (Imperial) gallons of distilled water per hour.—Pharm. Journ., Jan. 12, 1907, 23-24.

Evaporating Dishes—Memorandum Attachment.—Gustav Mü has introduced into use evaporating dishes which are provided with a lateral attachment with a dull surface suitable for writing with a hard

FIG. 13.



Steam-Heated Water Still.

FIG. 14.



Evaporating Dish.

pencil or ink. The construction is shown by Fig. 14. Memoranda made upon the surface of this attachment may be rubbed off with comparatively little trouble, but are not liable to be obliterated during the use of the dish, since they are beyond the direct region of the steam.—Pharm. Ztg., li, No. 63 (1906), 703.

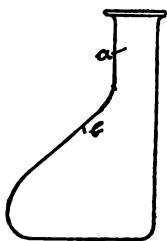
Evaporating Flask—Construction for Rapid Evaporations to Dryness.—C. Zenghelis recommends the apparatus shown by Fig. 15 for rapidly evaporating solutions to dryness without loss of dissolved substance. It consists of a so-called Philipps' beaker of 300 or 400 Cc. capacity, and

provided on opposite sides with two holes with margins bent inwardly, and situated about 3 Cm. below the upper edge of the beaker. The beaker is covered with a watch-glass, concave side down, and the center of which is bored to receive and support a glass rod, the lower end of which is thin and rounded, and ends within about 1 Cm. of the bottom of the beaker. The beaker may be heated on a sand-bath or asbestos plate,

FIG. 15.

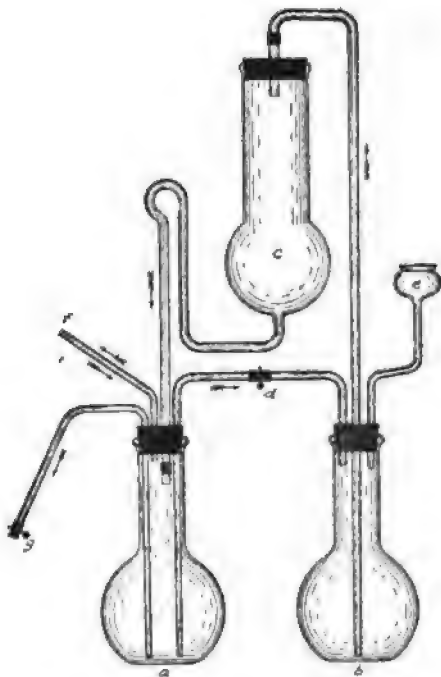
Evaporating
Flask.

FIG. 16.



Boiling Flask.

FIG. 17.



Extraction Apparatus.

but best in an asbestos air-bath.—Merck's Rep., June, 1907, 172; from Chem. Ztg. Rep., xxxi, 133.

Boiling Flask—New Form.—Dr. W. von Bolton has a new form of flask (see Fig. 16) which differs from the Erlenmeyer flask in the position of its neck (*a*) which is placed to one side instead of the center as usual. By this modification loss of material through boiling is entirely prevented, as the spitting and projection of particles of the liquid chiefly takes place at the center of the flask. Such particles are caught by the inclined surface (*c*) and return to the contents of the flask.—Merck's Rep., June, 1907, 171; from Chem. Ztg. Rep., XXXI, 181.

Extraction Apparatus—Useful Form for Extractions with Water.—Allen Rogers has obtained excellent results by the use of the apparatus

constructed as shown by Fig. 17, in the analysis of tea, coffee, tannin, etc., where an aqueous infusion is necessary. Two flasks, *a* and *b*, are employed, and may be of any size desired. From the bottom of *b* a glass tube connects with *c*, which contains the material to be extracted; at the end of *c* is a Bunsen valve. To charge the apparatus, the clamp *d* is opened and water introduced through *e*; the clamp *d* is then closed, and suction applied at *f*, thus causing the liquid to pass over the material in *c*. The solution having passed from *b* to *a*, the clamp *d* is again opened, and by blowing at *f* it is forced back into *b*. When a concentrated solution has been obtained in *a*, it may be removed by opening *g* and blowing in at *f*. A fresh supply of water is then added, and the process continued until the extraction is completed. The flasks are heated on a water-bath. The suction is secured by means of a filter-pump, and can be regulated so that the solvent passes over the material dropwise.—Merck's Rep., Aug., 1906, 226; from Journ. Amer. Chem. Soc.

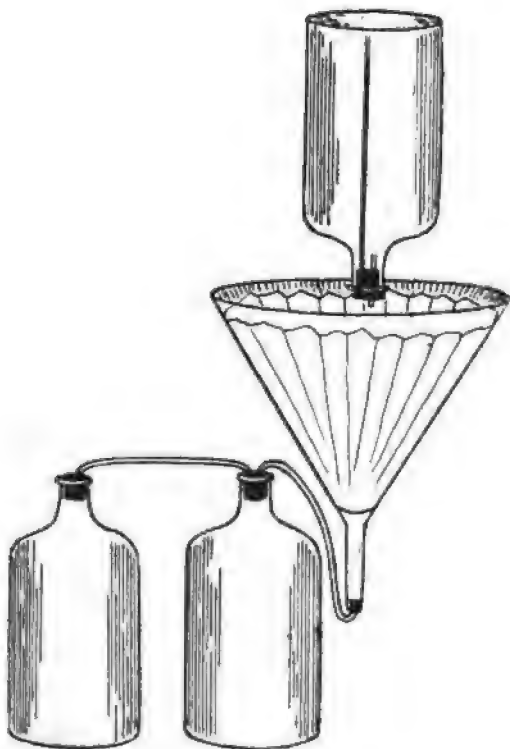
Receiving Bottles—Method of Graduation.—J. T. Davison finds that one of the neatest and most satisfactory ways of graduating a bottle for receiving percolates, or for measuring, is by the use of some white bath-tub enamel and carriage black. Practical druggists are familiar with the annoyance and loss of time caused by the loosening and construction of the usual paper slip affixed to the side of a bottle. Place the bottle it is desired to graduate in a horizontal position; paint a stripe of white enamel one-half to one inch in width, according to the size of the bottle, down the side; make the uneven edges straight by wrapping a piece of thin cloth wet with oil of turpentine about the finger and drawing along both sides of the stripe. Allow to dry and repeat the coat if necessary. In then graduating, after adding each portion of water, make a pencil mark horizontally across the stripe at the proper levels. When this is done, finish by painting the index marks with the carriage black. The finished product is a graduated bottle that is a joy to the worker.—Drugg. Circ., May, 1907, 347.

Circulatory Displacement—Application to Various Products.—A. H. Bosworth observes that a percolator may often take the place of a jar for the maceration of drugs. Thus: arrange the percolator as though you were going to proceed to percolation, with cotton in the neck, and with the usual means provided for stopping the flow of the liquid. Suspend the drug in a bag and macerate by circulatory displacement. When the drug has been sufficiently extracted, allow it to run into the receiver and the preparation is thus filtered and finished. This process is useful in making such things as tincture of benzoin, tincture of guaiac, green soap, soap liniment, etc.—Bull. Pharm., April, 1906, 163.

Dialysis—Application in Toxicological and Pharmaceutical Examinations.—H. K  hne and H. Mass communicate the results of some preliminary experiments undertaken, in the first place, to determine the value of

dialysis as an aid to the toxicological determinations of mineral poison in organic substances, and secondly for the quantitative determination of alkaloids in both toxicological and pharmaceutical analyses. The results, while not conclusive, point out that very satisfactory quantitative results are obtainable by the aid of dialysis with such substances as arsenic and mercury in organic admixture, after the destruction of the organic substance with oxidizing agents in the usual manner, even though the destruction of organic matter is not complete, thus avoiding a repetition of the tedious oxidizing process and avoiding loss of the mineral poison sought. Taking 50 Mgm. of the substance in operation, the authors were able to determine 49.8 Mgm. As (as As_2O_3) and 49.5 Mgm. of Hg respectively in the diffusate. Their experiments with alkaloids—morphine, quinine and strychnine—although not undertaken quantitatively, also have given results

FIG. 18.



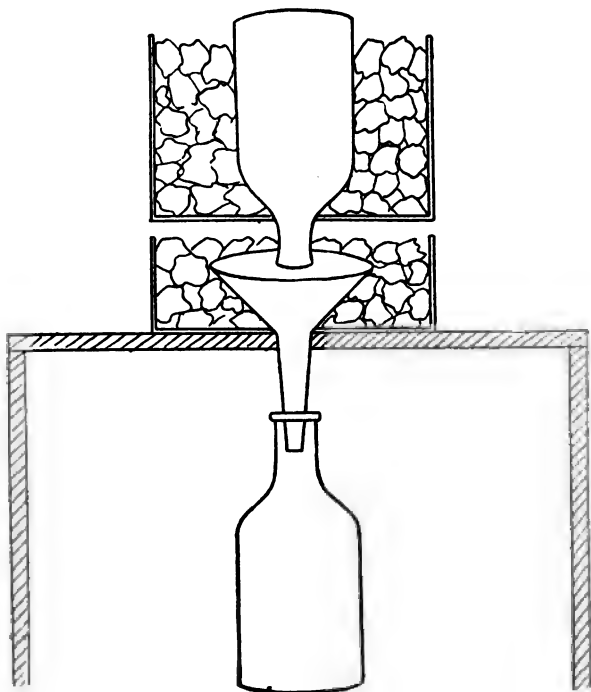
Automatic Filtration.

which justify the belief that the method of dialysis can be made available for their quantitative determination. Owing to the want of time and the necessary means, the authors are at present unable to follow up their inter-

esting experiments, but they express the hope that these may be taken up by others more favorably situated in these respects.—Pharm. Ztg., li, No. 67 (1906), 746-747.

Filtration—Automatic Supply.—Jos. F. Hostelly suggests the arrangement shown by Fig. 18 for filtering large quantities of liquids automatically. A filter in a funnel of one gallon capacity, for example, is filled with the liquid to be filtered, after the orifice of the funnel is connected by means of a rubber tube with a receiving bottle of one gallon capacity, and this, in turn, with a second receiving bottle of the same capacity. All the points must be air-tight, but a small hole is bored into the cork of the second receiver for the escape of air as the filtrate collects in the receiver.

FIG. 19.



Cold Filtration.

A one-gallon bottle, filled with the liquid to be filtered is then inverted over and into the liquid on the filter, and automatically supplies the filter as soon as the level of the liquid falls below the mouth of the air tube provided in the upper bottle as shown in the drawing. The end of the tube delivering the filtrate into the first receiver must be a little higher than the apex of the filter. The arrangement is convenient for continuous

filtrations over night into vessels and with funnels of limited capacity.—West. Drugg., July, 1906, 361.

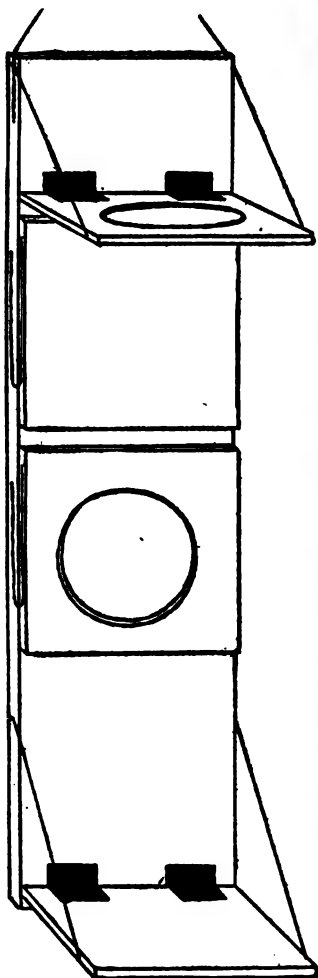
Cold Filtration—Convenient Apparatus.—Paul Caldwell has designed the apparatus shown by Fig. 19, which he finds useful for making solutions containing thymol, menthol, or volatile oils and the like, that are liable to become turbid on change of temperature below the normal. The apparatus is made of galvanized iron, tin, or other similar suitable material, and consists of two parts. The upper part consists of an open box with a hole in the center of its bottom, into which the neck of the can (reservoir) is fitted water-tight. The lower part is similar to the upper, but is not so deep, and is fitted in the same way with a funnel instead of a can. In use the lower box is placed on a bench in which there is a hole large enough to admit the spout of the funnel. The liquid to be filtered is placed in the securely corked reservoir, ice and salt are packed around it until it is sufficiently chilled; then the funnel is surrounded by ice and salt, a filter is introduced, and the two parts of the apparatus being brought together, the cork is removed from the neck of the reservoir, which must extend some distance into the filter and funnel, and filtration is allowed to proceed automatically.—Drugg. Circ., April, 1907, 293.

Portable Filter Rack and Stand—Convenient Forms.—Jos. F. Hostelly describes a convenient portable filter rack or bracket which is shown by the accompanying drawing (Fig. 20). The perforated shelves for holding the filters are strongly hinged to the back of the bracket, likewise the shelves for supporting the filtrate receivers. The sketch shows the bracket arranged for percolation, the highest and lowest shelves being called into service. For a filtering operation the distance between the filter shelf and the shelf for the filtrate receiver is lessened by dropping the shelf just beneath the filter. This bracket may be hung in most any convenient location. If substantially made and strongly hung, two filtering operations may be conducted on it at the same time.

A handy, portable filter stand is shown by Fig. 21. The top of this stand is a shallow box, about one foot square and about three inches deep. The lid of the box is hinged and in the bottom a round hole has been cut to receive a large funnel. This filter support is made to stand on four legs, cut from narrow strips of board, braced at the bottom by four strips of the same. The shelf for the filtrate receiver is hinged to fold up against the legs of the stand when not in use. In an operation requiring a large filter and a capacious filtrate receiver, the shelf, not needed, is folded up and held by a little catch. Triangular blocks of wood nailed to the legs of the stand support the shelf when down. A false bottom is hinged to the true bottom of the shallow box; in this false bottom there is a round hole somewhat smaller than the one in the true bottom; when a small funnel is to be used for filtering, the hole in the false bottom

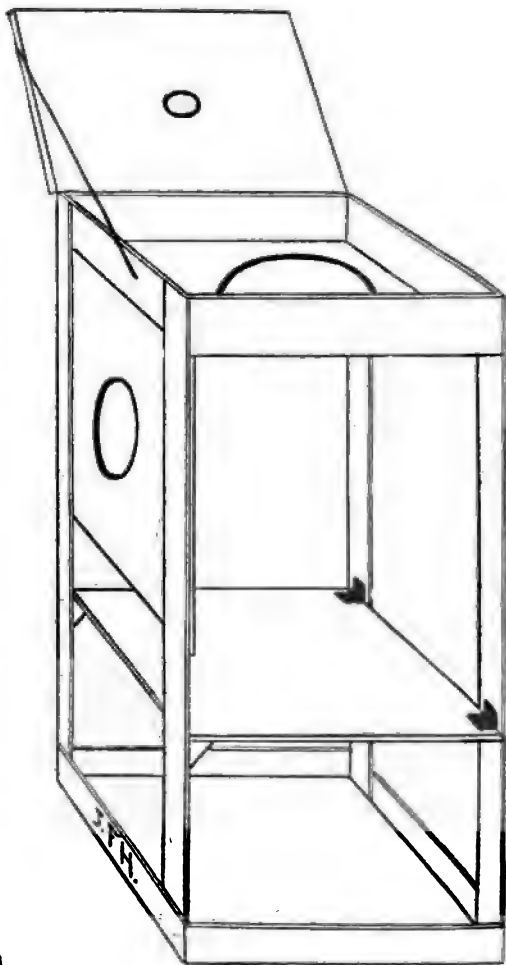
accommodates it; when a larger filter is to be employed the false bottom is released and let swing down against the legs of the filter stand. Two small hooks hold the false bottom in position when in use. A small round

FIG. 20.



Portable Filter Rack.

FIG. 21.



Portable Filter Stand.

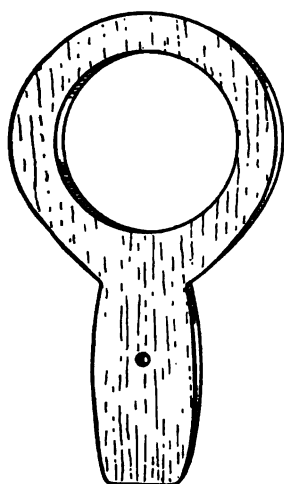
hole is bored in the lid of the filter stand to receive the neck of a large feeding bottle to conduct uninterrupted filtration.—*Western Drugg.*, July, 1906, 361 and 363.

Filter Rack—Cheap and Convenient Construction.—M. R. Shotwell finds the device represented by Fig. 22 to be very convenient at the prescription case. It is a small filter rack, which is easily cut from the lid of

a cigar-box, and is secured by a screw to the under part of the lower shelf of the prescription counter. When not in use it may be turned to one side, where it is out of the way.—Bull. Pharm., May, 1907, 208.

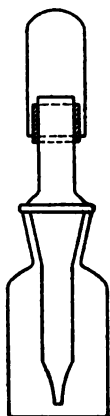
Pipette Bottle—Improved Construction for Microscopic Reagents.—Dr. Schürhoff observes that the pipettes provided in the containers for microscopic reagents soon become defective owing to the destruction of the rubber bulb, either by direct contact with the reagent or its vapor. He therefore suggests the substitution of a glass bulb for the rubber bulb which slides up and down the upper stem of the pipette, and rendered air-tight

FIG. 22.



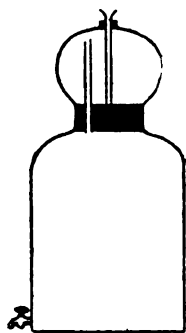
Filter Rack.

FIG. 23.



Pipette Bottle.

FIG. 24.



Protective Container.

by the aid of a short section of rubber tubing, as shown by the accompanying cut (Fig. 23). Suction is produced by drawing the glass bulb (a section of glass tube closed at one end) upward, and the reagent is delivered by pressing the bulb downward. The rubber ring will remain intact for a long time, but is readily replaced when necessary by a fresh segment of tubing. A further advantage is the facility with which the pipette may be cleansed.—Pharm. Ztg., li, No. 84 (1906), 931.

Protective Container for Solutions—Exclusion of Atmospheric Carbonic Acid.—Denis has devised and describes the container for solutions which must be protected from the action of atmospheric carbonic acid as shown by Fig. 24. It consists of a wide-mouth bottle provided with a faucet near the bottom and a hollow glass stopper, accurately ground into the neck and carrying two glass tubes, the one communicating with the interior of the bottle, reaching nearly to the top, the other communicating with the outer air, reaching nearly to the bottom of the hollow stopper. In use,

the stopper is about half filled with lime or baryta water and inserted into the bottle containing the liquid to be protected. On withdrawing portions of this liquid by opening the faucet, air is admitted through the opening in the stopper, but having to pass through the lime or baryta water, it is completely freed from CO₂ before it reaches the interior of the bottle.—Pharm. Ztg. lii (1907), No. 7, 66.

Glass Vessels—Prevention of Fracture by Hot Liquids.—C. W. Coombs has for years been filling cold bottles with hot liquids, and never experienced a breakage. His method is quite simple. Having assured himself of the soundness of the container by carefully examining it for bad flaws or visible cracks and by ringing the glass with the knuckles of one hand while holding it loosely in the other hand, the container (bottle) is placed on a wet cloth and the hot liquid poured into it through a funnel. The cloth may be soaked in hot or cold water, it being essential only that it be wet.—Merck's Rep., July, 1906, 192.

Glass Shelf Ware—Cracking and Splintering.—Leo Eliel can find no satisfactory explanation why some shelf-bottles have a tendency to crack and splinter, especially around the neck, while others remain intact. Bottles containing Ammonia Water, Lime Water, Fowler's Solution and the Aromatic Waters, in particular, have this disagreeable habit.—Proc. Indiana Pharm. Assoc., 1906, 69.

Old Bottles and Utensils—Method of Cleaning.—Prof. Francis Hemm recommends the following solution for cleaning greasy bottles and utensils:

Castile soap in shavings.....	§ i.
Water	§ xii.
Boil, cool and add	
Ammonia water	§ ii.
Alcohol	§ ii.

For cleaning old bottles, he recommends as the first step to fill them with nearly hot water and let stand over night; now rinse and drain. If this does not clean them, proceed as follows: Pour some five or ten per cent. solution of lye or caustic potash in bottles, cork with old cork and shake or rotate so as to bring the alkali solution in contact with every portion of the inside of the bottles, let stand with occasional agitation for twenty-four to forty-eight hours then rinse and drain. If time saving is an object use hot lye solution instead of cold. If not yet clean, treat with commercial nitric or muriatic acid or a mixture of powdered bichromate of potash and commercial sulphuric acid. With few exceptions, no matter how much stained, bottles will be cleaned by pursuing above course.—Meyer Bros. Drugg., August, 1906, 236.

Corking Device—A Useful Hint.—A. H. Bosworth gives directions for making a "corking device" as follows: Take a small "riveting" hammer, slip a rubber crutch-tip over the head, and you have a bottle-corking

machine which is just as useful to cork one bottle as it is a thousand, and you don't have to move the bottles to the machine, either! Soften the corks by steaming or moistening, and you can pound them in tight with never a broken bottle, chipped neck, or cut hands.—Bull. Pharm., May, 1907, 209.

Corks—Precautions in Storage and Handling.—The "Corkmakers Union" gives the following practical rules for the handling of corks:

Storage.—The store-room must be dry, as in a damp room the corks attract moisture, in consequence of which molds attach themselves to them, and they acquire not only an unpleasant musty odor, but a bad taste easily communicated to the contents of bottles stoppered with them.

Softening Before Use.—Lay the corks for at least two hours before use in a clean basket of peeled willow, lined with a clean packing cloth, and sprinkle with a little sprinkling can, repeating the sprinkling every half hour, using clean, pure cold water only. Before each sprinkling shake the basket energetically. Corks treated in this way, or, as it is called in the trade, 'a la Preissnitz,' however you may regard them, are perfect and complete bottle stoppers. Particular stress is laid on the avoidance of scalding or the use of hot water for softening the corks. "Among apparently good, healthy corks, we frequently come across a cork that has been scalded, or at least treated with hot water, and this one cork will affect every other with which it comes in contact, causing them to impart, especially to table wines, a 'corky' flavor. When you find your corks have been scalded before they come into your hands, lose no time in rinsing them with cold water and drying them out." Nat. Drugg., March, 1907, 95; from Vienna Drog. Ztg.

White Capping-Wax—Formula.—Crawford T. Ruff gives the following directions for preparing and using a capping-wax, which is especially fine for capping toilet preparations: Melt 8 ounces of white wax over a spirit lamp. For this purpose the wax may be put in any cheap tin or porcelain vessel with a handle. When the wax is melted add 2 drachms of thick mucilage of tragacanth and 1 ounce of bismuth subnitrate. Stir briskly until a uniform mixture results. The preparation is now ready for use. Dip the necks of stoppered bottles in to the desired depth. The substance will congeal almost immediately. Repeat this operation about three times and you will have a beautiful white cap—firm and yet easily removed. During the capping process the mixture must be stirred and held over the lamp from time to time.—Bull. Pharm., May, 1907, 208.

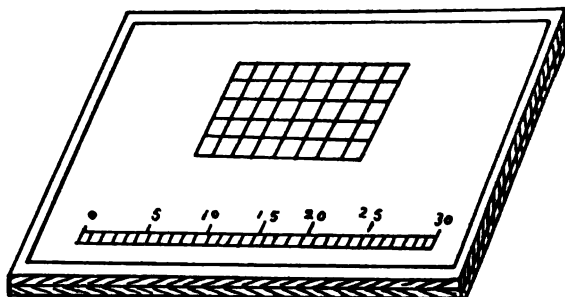
Labels—Method of Pasting on Tin.—S. L. Weyandt recommends the following method for pasting labels on tin or aluminum surfaces: Put a few drops of compound tincture of benzoin on the surface and apply a lighted match. When the burning ceases apply a dry gummed label. It will stick for all time.—Bull. Pharm., April, 1907, 164.

H. V. Lott similarly recommends that a few drops of tincture of myrrh be rubbed on the metal surface, allowed to dry, and the label then pasted on in the usual way.—*Ibid.*, June, 1907, 249.

Labels on Tin—Use of Glycerin to Secure Adhesion.—After experimenting in various ways during the past thirty years to prevent labels from curling off metal surfaces, William G. Toplin has found a simple expedient to consist in giving the back of labels a thin coat of pure glycerin before applying the paste. A quantity of glycerin, sufficient to moisten the tip of the finger, is applied, and the label is then pasted on as usual. The paper absorbs enough glycerin to prevent contraction and consequent curling, yet permits the necessary drying of the adhesive.—*Amer. Journ. Pharm.*, July, 1906, 332.

Uniformity in Externals—Importance.—Introducing some practical recommendations concerning the dispensing of the various forms of medicaments on prescription, A. W. Bromley observes that uniformity in the outward appearance of medicines dispensed from the same prescription is scarcely less important than in the medicine itself. The patient, whom ill health has rendered nervous and perhaps even a little hysterical, regards his bottle of mixture or his box of pills as a mysterious and awesome thing. He would like to investigate to assure himself that he is getting exactly what he ought to have, but as he cannot do that, he solaces himself by studying the label, the package, and the general appearance. The least variation in these is likely to arouse suspicion in his mind, and set

FIG. 25.



Pill Tile.

his imagination to work, so that, when he tastes the medicine, he is sure it is different from the previous bottle. Send a hypochondriac his medicine in a bottle different from the usual kind, and, as likely as not, he will suspect that you have made a mistake in the mixture itself. Then he will taste it, and as he tastes *with the object of confirming* his suspicion, he *will confirm* it.—*Pharm. Journ.* Oct. 27, 1906, 458.

Pill Tile—Cheap and Convenient Construction.—L. R. Rice gives the

following simple instructions for making a first class pill tile economically : On a piece of white paper draw off the lines shown in Fig. 25, and, having placed the paper between two pieces of glass, cement them together.—Bull. Pharm., June, 1907, 249.

Sink and Draining Board—Imitation of Porcelain.—D. A. Frick calls attention to "White Enamel" for the purpose of giving to old metallic sinks and the drawing board of soda fountains the appearance of porcelain. Several coats of this enamel should be applied with a brush, allowing each coat to become perfectly dry before applying the next.—Bull. Pharm., June, 1907, 250.

Bung Protector and Faucet—A Practical Device.—Aug. Seebeck has devised a protective tin cover for bungs which on the removal of a central

FIG. 26.



FIG. 27.



Bung Protector and Faucet.

nail unfolds, forming an outflow conduit for the convenient removal of the contents of the barrel after the bung-stopper has been removed. The device is shown by Fig. 26 and 27 and needs no other explanation.—Pharm. Ztg. lii (1907), No. 15, 149.

B. PREPARATIONS.

U. S. P. and N. F. Preparations—Percentage of Alcohol.—Dr. A. B. Lyons has prepared the following tables showing the percentages of alcohol contained in the fluidextracts, tinctures and elixirs official in the U. S. Pharmacopœia and the National Formulary, which are reproduced here (from Amer. Drugg.) because their importance in connection with the requirements of the Pure Food and Drugs Law. Concerning the percentages of alcohol in fluidextracts, he says that it is not easy to declare off-hand what proportion of alcohol (per cent. by volume) we may expect to find

in a given official fluidextract, and he points out the difficulties that are encountered in such calculations, such as condensation of volume of alcohol on dilution, introduction of moisture from the drug, compensation for volume of dissolved extract, etc., etc. By taking into account the proportion of extractive usually obtained from each drug, he has calculated for each of the official fluidextracts: (1) The maximum alcohol percentage (that possible when a "perfectly" dry drug is used and every precaution taken to prevent loss by evaporation) and (2) the alcohol percentage most likely to be realized under ordinary working conditions. These theoretical figures he has found to be very close as a rule to those actually obtained in practice, although a percentage considerably lower is not proof that the official formula has not been strictly followed.

TABLE OF ALCOHOL PERCENTAGES OF THE U. S. P. FLUIDEXTRACTS.

Drug.	Per cent. alcohol in menstruum.	Maximum per cent. Per cent. abs. alcohol in fluidextract.	Per cent. abs. alcohol to be expected in fluidextract.
Aconite	72.9	59.7	56.8
Apocynum	58.7	50.4	46.9
Aromatic powder.....	94.9	79.0	73.1
Belladonna	77.5	67.4	63.5
Berberis.....	48.9	45.5	42.6
Bitter orange	65.0	55.9	52.0
Buchu	72.9	62.7	56.8
Calamus	72.9	65.6	61.2
Calumba.....	68.2	64.1	60.0
Capsicum.....	94.9	82.5	75.9
Cascara sagrada.....	39.1	31.6	29.7
Cascara sag. arom.....	49.9	40.4	37.9
Chimaphila	48.9	42.6	39.2
Chirata	48.9	47.5	41.6
Cimicifuga.....	94.9	89.2	83.5
Cinchona.....	77.5	67.4	63.5
Coca.....	48.9	40.4	37.7
Colchicum seed	65.0	60.5	57.9
Conium	48.0	45.1	43.7
Convallaria	63.4	55.2	50.8
Cubeb	80.7	88.3	80.7
Cypripedium	48.9	42.8	40.6
Digitalis	48.9	39.6	36.7
Ergot	48.0	41.3	38.4
Eriodictyon.....	77.5	62.7	58.9
Euonymus	77.5	72.0	66.6
Eucalyptus	72.9	60.8	58.3
Eupatorium.....	48.9	42.4	39.2
Frangula	37.6	31.9	30.0
Gelsemium	94.9	86.4	80.7
Gentian	48.9	39.6	37.2

Geranium	58.7	49.9	47.0
Ginger	94.9	89.7	82.6
Glycyrrhiza	19.3	19.3	19.3
Grindelia	72.9	61.9	58.3
Guarana	48.9	40.1	39.6
Hamamelis leaves	29.2	24.8	23.0
Hydrastis	58.7	50.4	46.9
Hyoscyamus	65.0	55.9	52.0
Indian cannabis	94.9	86.3	78.7
Ipecac	72.9	64.1	60.5
Krameria	48.9	41.1	39.1
Lappa	48.9	41.6	39.1
Leptandra	72.9	62.7	59.0
Lupulin	94.9	79.5	75.9
Matico	72.9	66.3	58.0
Mezereum	77.5	72.0	70.0
Nux vomica	69.2	63.0	60.9
Pareira	58.7	51.0	46.9
Phytolacca	48.9	41.6	39.2
Pilocarpus	48.9	44.0	40.1
Podophyllum	77.5	69.7	64.3
Pomegranate	44.1	37.9	36.1
Quassia	32.4	30.8	27.2
Quercus	44.1	37.0	34.4
Quilaja	48.9	42.6	40.1
Rhubarb	77.5	62.8	58.9
Rhus glabra	44.1	41.0	37.9
Rose	44.1	38.3	35.3
Rubus	48.9	41.1	38.2
Savin	94.9	78.8	74.0
Sarsaparilla	32.4	29.5	27.6
Sarsaparilla comp.	44.1	38.8	36.1
Scopola	77.5	67.4	63.5
Scutellaria	48.9	41.6	38.2
Senega	63.1	53.0	49.2
Senna	48.9	43.1	41.6
Serpentaria	77.5	72.8	66.6
Spigelia	48.9	44.5	41.6
Staphisagria	77.5	74.0	72.1
Stillingia	48.9	44.5	41.6
Stramonium	65.0	55.3	50.7
Sumbul	72.9	60.5	56.8
Taraxacum	46.5	39.1	36.3
Triticum	24.2	24.2	24.2
Uva ursi	19.3	16.2	14.6
Valerian	72.9	65.6	61.2
Veratrum	94.9	86.4	80.7
Viburnum opulus	65.0	56.6	53.4
Viburnum prunif.	65.0	58.5	54.6
Wild cherry	19.3	16.8	15.9
Xanthoxylum	72.9	65.6	61.2

PER CENT. OF ALCOHOL IN FLUIDEXTRACTS OF THE NATIONAL FORMULARY.

Name of fluidextract.	Max. per cent. (vol.) abs. alc.	Per cent. abs. alc. to be ex- pected.	Name of fluidextract.	Max. per cent. (vol.) abs. alc.	Per cent. abs. alc. to be ex- pected.
Adonis	87.8	81.5	Dogwood (flowering) ..	36.2	34.0
American spikenard ...	58.2	55.0	Frostwort	45.0	42.0
Angelica root	51.6	49.0	Goldthread	42.6	40.0
Arnica flowers	41.7	38.0	Green osier... ..	41.1	38.5
Bethroot	52.2	49.5	Hop	53.7	49.5
Bladderwrack	67.4	62.5	Hydrangea	54.6	51.5
Blue cohosh	63.4	60.0	Jalap	87.1	80.5
Boldo.....	55.3	50.5	Juniper	37.7	34.5
Buchu comp.....	56.6	52.5	Kavakava	55.7	52.5
Buckbean	41.7	38.0	Kola	22.0	21.0
Butternut	42.6	40.0	Lily of the valley	41.1	38.0
Calendula	57.8	53.5	Malt	19.8	18.5
Cascara sagrada, bitter- less.....	...	...	Mullein	46.0	42.5
Celery	61.8	59.0	Nettle	45.5	43.0
Coffee, green	20.6	19.5	Parsley root	41.1	38.5
Coffee, roasted	21.0	19.5	Stargrass	45.0	42.0
Cornsilk	42.6	39.0	Stillingia comp.....	44.1	41.0
Coto	75.2	71.0	Tea	20.8	19.5
Damiana	57.9	53.5	Turkey-corn	67.4	63.5
			Vervain	45.5	42.5

PERCENTAGE OF ALCOHOL IN U. S. P. TINCTURES.

Drug.	Per cent. alcohol in men- struum.	Per cent. alcohol (approx.) in tincture.	Drug.	Per cent. alcohol in men- struum.	Per cent. alcohol (approx.) in tincture.
Aconite.....	68.2	66.5	Cinnamon.	65.5 } 73.0 }	65.0
Aloes	48.9	42.5	Colchicum seed	58.7	58.0
Aloes and myrrh	72.9	64.5	Digitalis	48.9	47.5
Arnica.	48.9	46.5	Ferric chloride.....	...	64.5
Asafetida	94.9	85.0	Gambier compound ...	48.9	48.0
Belladonna leaves.	48.9	48.0	Gelsemium	63.4	62.5
Benzoin	94.9	82.0	Gentian compound....	58.7	56.0
Benzoin compound....	94.9	77.0	Ginger.	94.9	91.0
Calendula.....	94.9	91.0	Guaiaac	94.9	82+
Calumba.	58.7	57.0	Guaiaac, ammoniated. .	68.0	58+
Cannabis indica.....	94.9	93.0	Hydrastis	63.4	61.0
Cantharides	94.9	94.0	Hyoscyamus.	48.9	48.0
Capsicum	90.8	89.0	Iodine.....	94.9	93.0
Cardamom	48.9	48.0	Ipecac and opium. ....	...	12+
Cardamom compound..	46.5	46.0	Kino .....	...	61.0
Cimicifuga	94.9	93.0	Krameria	48.9	46.5
Cinchona	65.5 } 73.0 }	65.0	Lactucarium.....	52.5 } 48.9 }	47.5
Cinchona compound...	65.5 } 73.0 }	65.0	Lavender compound...	72.9	71.5

Lemon peel.....	94.9	58+	Quillaja.....	34.0
Lobelia.....	48.9	48.0	Rhubarb.....	48.9 } 45+
Musk.....	48.9	48.5		54.3 }
Myrrh.....	94.9	90.0	Rhubarb, aromatic....	48.9 } 45+
Nutgall.....	86.5 } 94.9	82+		54.3 }
Nux vomica.....	72.9	71.5	Sanguinaria.....	58.7 56.5
Opium.....	48.9	47.0	Squill.....	72.9 71.5
Opium, camphorated...	48.9	47.0	Serpentaria.....	63.4 62.0
Opium, deodorized....	19.2		Stramonium.....	48.9 48.0
Orange peel, bitter...	58.7	56.0	Tolu.....	94.9 82+
Orange peel, sweet....	94.9	58+	Valerian.....	72.9 70.5
Physostigma.....	94.9	94.0	Valerian, ammoniated..	68.0 65.5
Pyrethrum.....	94.9	91.5	Vanilla.....	63.4 56+
Quassia.....	34.1	33.5	Veratrum.....	94.9 93.0

PERCENTAGE OF ALCOHOL IN N. F. TINCTURES.

Drug.	Per cent. alcohol in men- struum.	Per cent. alcohol (approx.) in tincture.	Drug.	Per cent. alcohol in men- struum.	Per cent. alcohol (approx.) in tincture.
Aconite, Fleming 1	94.9	81.0	Jalap compound	65.0	62.5
Aconite, Fleming 2 . . . .	...	68.0	Kino compound. . . . .	...	53+
"Antacid" (guaiac co.)	94.9	76.0	"Pectoral" (opium and		
"Aromatic" (cinnamon			catechu comp.). . . .	48.9	48.0
co.).	65.0	62.5	Pimpinella	65.0	63.0
"Bitter" (gentian and			Poppy. . . . .	...	28.0
centaury co.).	65.0	62.0	Rhubarb, aqueous 1 . . .	...	10.5
Capsicum and myrrh. . .	86.5	82.5	Rhubarb, aqueous 2 . . .	...	11.0
Cinchona, detannated..	...	54+	Rhubarb and gentian 1.	48.9	47.5
Coto	94.9	93.0	Rhubarb and gentian 2.	48.9	49.5
Cresol, saponated. . . .	...	19.0	Rhubarb, vinous	19+	23+
Cudbear	32.4	31.5	Tolu, ethereal . . . . .	...	68+
Cudbear compound. . . .	32.4	30.0	Tolu, soluble	32.4	20.0
Ferrated extract apples. .	...	9.5	Vanillin compound. . . .	...	19.0
Ferric chloride, ethereal. .	...	68.0	Viburnum compound. . .	88.2 } 80.5 }	86+
Iron citro-chloride . . . .	...	15.0	"Warburg" (anti-peri-		
Green soap compound..	94.9	80+	odic)	58.7	56.5
Guaiac compound	48.9	46.0	"Warburg," with aloes. .	...	56.0
Iodine, Churchill's	72.9	68.0	Zedoary, bitter.	65.0	44+
Iodine, decolorized. . . .	80.6	75.0			
Jalap.	65.0	61.5			

PERCENTAGE OF ALCOHOL IN U. S. P. ELIXIRS.

	Per cent. alcohol.
Adjuvant.....	23.0
Aromatic.....	23.5

PERCENTAGE OF ALCOHOL IN N. F. ELIXIRS.

Name of Elixir.	Per cent. (approx.) of alcohol.	Name of Elixir.	Per cent. (approx.) of alcohol.
Ammonium bromide.....	23.0	Guarana	29.5
Ammonium valerianate.....	24.0	Hops.....	29.0
Ammonium valerianate with quinine.....	24.0	Hypophosphites	16.5
Anise	24.0	Hypophosphites with iron.....	11.0
Bismuth	12.0	Iron hypophosphites.....	21.5
Blackberry, compound.....	12.0	Iron lactate	23.0
Black haw	29.5	Iron phosphate	22.0
Buchu	31.0	Iron pyrophosphate	22.0
Buchu, compound	34.0	Iron pyrophosphate, quinine and strychnine.....	24.0
Buchu, with potassium acetate..	30.0	Iron, quinine and strychnine...	25.0
Buckthorn	30.5	Jaborandi.....	24.0
Caffeine ^o	18.0	Licorice	23.5
Calcium bromide.....	23.0	Licorice, aromatic.....	23.5
Calcium hypophosphite.....	23.5	Lithium bromide.....	23.0
Calcium lactophosphate	21.0	Lithium citrate.....	23.0
Cascara sagrada.....	31.0	Lithium salicylate... ..	23.0
Cascara sagrada, compound....	28.0	Malt and iron	17.0
Cathartic, compound.....	29.0	Paraldehyde.	38.0
Celery	37.5	Pepsin.....	16.5
Chloroform, compound	60.0	Pepsin and bismuth.....	12.0
Cinchona	24.0	Pepsin, bismuth and strychnine..	12.0
Cinchona and hypophosphites..	20.5	Pepsin and iron.....	16.5
Cinchona and iron	22.5	Phosphorus.....	26.0
Cinchona, iron and bismuth....	19.5	Phosphorus and nux vomica....	27.5
Cinchona, iron, bismuth and strychnine	19.0	Potassium acetate	23.0
Cinchona, iron and calcium lactophosphate	21.0	Potassium acetate and juniper..	24.0
Cinchona, iron and pepsin.. ..	17.0	Potassium bromide	22.0
Cinchona, iron and strychnine..	22.0	Quinine and phosphates, compound	17.0
Cinchona, iron, pepsin and strychnine	16.5	Quinine valerianate and strychnine.....	24.0
Coca	28.0	Rhubarb	29.0
Coca and guarana.....	28.0	Rhubarb and magnesia....	24.0
Corydalis, compound.....	42.0	Salicylic acid	10.0
Cramphark, compound.....	34.0	Sodium bromide.....	22.0
Curaçao.....	25.0	Sodium hypophosphite.....	23.5
Damiana.....	44.5	Sodium salicylate.....	23.0
Digestive, compound.....	15.0	Stillingia, compound.....	28.0
Eucalyptus	29.5	Strychnine valerianate	24.5
Gentian	25.0	Taraxacum, compound	28.0
Gentian, glycerinated	11.5	Tar, compound.....	17.0
Gentian and iron phosphate....	24.0	Terpin hydrate.....	39.0
Gentian, with tincture of iron chloride	24.0	Terpin hydrate, with codeine. .	39.0
Glycerophosphates	7.0	Terpin hydrate, with heroine...	39.0
Grindelia	38.0	Wahoo	27.0
		Yerba santa, aromatic.....	16.0
		Zinc valerianate.....	30.5

AQUÆ.

Aromatic Waters—Proposed Modification of the G. P. Requirement.—

It is suggested by Franz Wipperfurth that in the new edition of the German pharmacopœia permission shall be given for the extemporaneous preparation of certain aromatic waters (which are confessedly rarely prescribed) by solution of the volatile oil in water, in place of the distillation of the drug with water as required in the present edition. He further suggests that the minimal content shall not be below 0.6 in 1000, and that the preparation be effected by triturating 0.6 to 1.0 Gm. of the oil with 5.0 Gm. of magnesia, shaking the mixture with 1 liter of hot distilled water, until cool, and then filtering. This extemporaneous method is however to be confined to anise, caraway, chamomile, melissa, sage and parsley water, with the addition, possibly, of peppermint water.—Pharm. Ztg., li, No. 73 (1906) 805.

Aromatic Waters—Preparation.—After experiments undertaken to determine the relative merits of the U. S. P., B. P. and other processes of preparing aromatic waters, Franklin W. Earl expresses the opinion that the hot-water agitation method is the best; the water does not change on keeping and the process produces a clear, saturated solution more expeditiously than any other method—the single exception being cinnamon water, which forms a permanently turbid liquid. He suggests that the waters be made in larger stock containers, an excess of oil being allowed to remain in contact with the water and the shelf bottles filled from these, as needed by filtering through well-wetted filters.—Amer. Journ. Pharm., Sept., 1906, 418.

Ammonia Water—Commercial Quality.—S. E. Thorley has made assays of commercial samples of ammonia water, with the following results: Two samples from drug stores, 7.534 per cent. and 9.287 per cent.; three samples from department stores, 3.236 per cent., 6.572 per cent. and 12.8 per cent.; three samples from grocery stores, 1.837 per cent., 2.025 per cent. and 8.309 per cent. of ammonia gas. With the exception of the department store sample assaying 12.8 per cent., none of the samples contained more than traces of weighable impurities. Amer. Journ. Pharm., Sept. 1906, 416.

CATAPLASMATA.

Cataplasm of Kaolin—Cause of Swelling After Preparation.—L. Z. Lantz and others having communicated their troubles experienced when endeavoring to prepare cataplasm of kaolin, the editor of the Bulletin of the A. Ph. A., Mr. Hallberg, makes the following observations: "The reports from many quarters that kaolin cataplasm swells after being prepared may be due to the reaction between the glycerin and boric acid, which it is supposed would be avoided by depriving the kaolin of water by heating. If the glycerin contains more than 5 per cent. of water, the reaction may

occur that would also occur in the cataplasm, being hygroscopic, if exposed to the air. Another factor is the variable composition of the kaolin, as shown in a recent work on 'Clays' by Heinrich Ries, Ph. D., published by John Wiley & Sons, New York. From the composition of these kaolins it will be observed that if the kaolin has not been thoroughly elutriated and dried it may contain considerable quantities of alkalies, which would cause the reaction. Some specimens contain notable quantities of iron, which would account for the coloration of the cataplasm due to reaction with the methyl salicylates."—Bull. Amer. Pharm. Assoc., Jan., 1907, 30.

Cataplasm of Kaolin—Conditions Determining its Satisfactory Preparation.—I. V. S. Stanislaus notes the following points which must be observed in making cataplasm of kaolin :

1. The kaolin should be of the variety known in commerce as "Bolted China Clay," and should be purchased from *bona-fide* merchants making a specialty of marketing clays and infusorial earth.

2. It should be heated for at least one hour with constant stirring before the boric acid is added.

3. The glycerin should be brought up to a temperature of 100° C. before adding to the mixed powders; thus heated, it aids in forming the paste.

4. After the addition of glycerin, heat and stirring should be continued for at least an hour, this being done to allow for the completion of the familiar reactions between the bicarbonates, the borates, and the glycerin.

5. The product should be stirred diligently until cool, when the aromatic ingredients are added.

6. After the flavoring constituents are added, the cataplasm should *at once* be packed into *air-tight* containers.

The manipulation recommended by the author is as follows: Heat the "bolted" kaolin for an hour, add the boric acid, mix slightly with the spatula, sift the mixture by means of a flour-sifter, mix intimately with the glycerin, reapply the heat, stir for another hour, remove the now smooth paste from the fire, and continue the stirring until cold. Aromatize and at once remove to air-tight containers to prevent the re-absorption of moisture from the air.—Bull. Pharm., April, 1907, 153.

Cataplasm of Kaolin—U. S. P. Formula All Right.—Prof. A. B. Stevens, speaking of the difficulties encountered by some in preparing cataplasm of kaolin, says that the U. S. P. formula is all right, but that the difficulty is in the manipulation. All of his students have made the preparation and not one has failed to obtain a good product. The best result is obtained by heating the kaolin in a suitable vessel at 100° C., with frequent stirring, for one hour, adding the boric acid, and then adding the glycerin, which has previously been heated to 100° C., and mixing until a homogeneous mass results; finally, when cold, adding the

other ingredients as directed by the Pharmacopœia.—Bull Pharm., Aug., 1906, 346.

Cataplasma Kaolini—Questionable Utility.—Dr. A. Herzfeld regards the introduction of cataplasm of kaolin into the U. S. P. as a step in a backward direction. He questions the utility of this preparation for the treatment of disease. All cataplasmata, even the most modern ones, act by irritation. They act upon the sound skin, and cause a hyperemia in consequence thereof. Kaolin cataplasm has not alone the disadvantage of being irritant by virtue of its glycerin content, but also in having kaolin as a vehicle, which makes it bulky and heavy. If a counterirritant effect is desired, the Pharmacopœia contains a number of them, which accomplish the same end and far simpler and cheaper, and without depressing the patient by their weight, while at the same time they have the advantage of allowing free access of fresh air to the skin. The author concludes that we need no new cataplasmata with kaolin as a vehicle, but we do need to teach the M. D. better and more—much more—materia medica.—Merck's Rep., July, 1906, 199; From Proc. N. Y. State Pharm. Assoc., 1906.

Cataplasma Kaolini, U. S. P. VIII—Practical Observations.—Herbert L. Flack finds the formula for cataplasm of kaolin more generally satisfactory if about 5 per cent. more of glycerin is used than is officially directed. On the other hand, the U. S. P. should permit some modification of the amount of glycerin to be used in the formula, since different samples of kaolin of the market possess different absorbent properties, as ascertained by the author's experiments and verified by similar statements from two large manufacturers of these preparations. Moreover, the preparation should be kept warm during at least four hours and occasionally stirred, before considering it finished; otherwise a slow effervescence occurs in some samples, which renders it unfit for dispensing in tight containers.—Amer. Journ. Pharm., 1906, 419.

CHARIÆ.

Turmeric Paper—Method of Preparing a Superior Article.—H. Cribb and F. W. F. Arnaud have modified the process of Cassal and Gerrani for the estimation of boric acid with turmeric paper, by substituting tartaric for oxalic acid in the preparation of the test paper. Two parts each of turmeric and tartaric acid are digested with 100 parts of hot alcohol until the tartaric acid is completely dissolved and strips of filter paper are then saturated with the filtered solution in the usual manner and dried in the dark. The test paper so obtained assumes a rose color with saturated solution of boric acid as well as with dilute solutions containing as little as 0.0025 per cent., or with solutions of borax acidulated with hydrochloric acid. A necessary condition, however, is that the paper is freshly prepared. The reaction is well adapted for a colorimetric quantitative esti-

mation of boric acid.—Pharm. Ztg., li, No. 62 (1906), 688; from the Analyst., 31, 147.

COLLODION.

Collodium Iodatum—*Formula Proposed for the G. P.*—Franz Wipperm recommends the following formula for iodine collodion for admission into the new German Pharmacopœia : Iodine, dried, 3.0; absolute alcohol, 6.0; castor-oil, 2.0; collodion, sufficient to make 100.0. The turpentine, which is a constituent of the

Collodium Elasticum of the G. P., is omitted in the proposed formula on account of its irritant action. As regards the formula for elastic collodion itself, the author suggests that the castor-oil (1.0) and turpentine (5.0) should be dissolved in spirit of ether (5.0), the solution filtered, evaporated, and sufficient collodion (to make 100.0) then added. This insures the removal of impurities and water which are usually present in the official (G. P.) turpentine. If larch-turpentine is substituted for the official pinus-turpentine, this purification is not necessary. The oil and larch-turpentine are melted together, and the collodion is then directly added.—Pharm. Ztg., li, No. 73 (1906), 806.

ELIXIRIA.

N. F. Elixirs—Improvements of Some Formulas.—Prof. Wilbur L. Scoville calls attention to some changes, which he considers improvements, in some preparations of the National Formulary. Among these the following elixirs come under his criticism and deserve particular attention since Prof. Scoville for a number of years served as chairman of the sub-committee on correction of formulas, of the N. F. Committee :

Compound Cathartic Elixir.—The quantity of saccharin directed will make a nauseating elixir. Half a gramme of saccharin is as much as can be used in 1,000 Cc., to be agreeable.

Compound Digestive Elixir.—The council on pharmacy of the American Medical Association has condemned all combinations of pepsin and pancreatin, and will request the American Pharmaceutical Association to dismiss this preparation from the National Formulary. Scientifically the mixture is absurd, and its use should be discouraged. The same is true of *Compound Powder of Pepsin*.

Elixir of Glycerophosphates.—The use of an aromatic elixir made with wine (125 Cc. per 1,000) or the addition of about 50 Cc. of wine to the formula, will greatly improve this preparation.

Glycerinated Elixir of Gentian—The formula submitted by the committee for this preparation, called for ground gentian and taraxacum roots instead of the fluidextracts, but the latter were substituted in the text because of a suggestion that the preparation is more easily made from

them. This is a doubtful expedient, because what time may be saved in the mixing is more than sacrificed later in clarifying the preparation. The following method is not only easier, but makes a better appearing and better flavored preparation.

Add to 10 grammes of ground gentian and 15 grammes of ground taraxacum the tincture of sweet orange peel and mix well. Then transfer to a bottle, add 400 Cc. of wine, and agitate frequently during two days. Filter, and pass enough wine through the filter to obtain 400 Cc. of filtrate. To this add the sugar (or the sugar may be dissolved in the mixture before filtering, if preferred), the acid, ether, tincture and 3 Cc. of solution of saccharin (not 30 Cc. which is an error), and the glycerin, and finally adjust to 1,000 Cc. with wine. This is bright and clear, more delicate in flavor, and more easily made than when fluidextracts are used.

Elixir of Terpin Hydrate.—This will deposit the terpin hydrate if chilled. When this occurs it can be restored by warming. It will not remain clear below 60° F.

In accordance with the rules of the Formulary, color agents are generally avoided in elixirs, but in the cases of elixir of terpin hydrate with codeine, and elixir of terpin hydrate with heroin, Prof. Nixon has suggested that these resemble the plain elixir of terpin hydrate in appearance and taste so closely as to be practically indistinguishable, and a distinguishing color for the two that contain alkaloids is very desirable. The point is well taken.—*Drugg. Circ.*, April, 1907, 294.

Elixirs—A Plea for their More Extended Admission into the U. S. P.—Prof. P. E. Hommell says a good word for the three elixirs now official in the U. S. P. and makes a plea for the admission of quite a number which are now available only in the National Formulary. Among these he mentions particularly the elixirs of sodium and potassium bromides, elixir, pepsin, bismuth and strychnine, elixir of calisaya bark, compound elixir of celery and compound elixir of cramp bark, all of which he considers ideal preparations. In fact, he considers elixirs to be ideal preparations for the administration of bitter and nauseous medicines. They are as a rule well tolerated by sensitive stomachs, and also rapidly absorbed by the system.—*Proc. N. J. Pharm. Assoc.*, 1906, 901-903.

Elixir Aromaticum, U. S.—Expedition Manipulation.—William G. Toplis considers the pharmacopœial directions for preparing aromatic elixir needlessly tedious and recommends the following modification and manipulation, which requires only about 15 minutes' time, with the pharmacopœial quantity, to produce a clear filtrate in which the sugar may be quickly dissolved by agitation: Mix 12 Cc. comp. spir. of orange with 30 Gm. purified talcum, in a mortar; gradually add a mixture of 238 Cc. of alcohol and 563 Cc. of distilled water, transfer the mixture to a wetted filter and when the filtrate has passed make it up with distilled water

through the filter to measure 818 Cc.; then add the sugar and dissolve it by agitation.—*Amer. Journ. Pharm.*, July, 1906, 332.

Simple Elixir—Precautions in Prescription as a Vehicle.—Edgar E. Heffner deprecates the free use of simple elixir as a vehicle in prescriptions intended for children on the ground of the excessive dose of alcohol that may in this way be administered to children of tender years. He has known it, for instance, to be prescribed in teaspoonful doses, to be given to a child four months' old every half to one hour. He calls attention also to a prescription of sodium bromide and chloral hydrate with simple elixir, in which a layer of chloral alcoholate was produced and which, floating upon the surface of the mixture, was liable to be unnoticed and taken at the first dose. In such prescriptions the use of an aromatic water and syrup as a vehicle would obviate any danger.—*Proc. Penna. Pharm. Assoc.*, 1906, 77-79.

Elixir of Iron, Quinine and Strychnine Phosphates—Manipulation.—Leo Eliel observes that the U. S. P. Elixir of Iron, Quinine and Strychnine Phosphates is easily and quickly made if certain changes are directed in the manipulation. The directions to add the Phosphoric Acid and then the Aromatic Elixir to the alcoholic solution of the Alkaloids, result in the production of a thick magma, which is but slowly dissolved; but if the Aromatic Elixir is added between the alkaloidal solutions solution and the Phosphoric Acid, a clear mixture results at once.—*Proc. Indiana Pharm. Assoc.*, 1906, 69.

Elixir Ferri, Quininae et Strychninae Phosphatum, U. S. VIII—Improved Formula.—Harry C. Hughes ascribes the difficulties experienced in preparing the official Elixir of Iron, Quinine and Strychnine Phosphates to the neutralization with ammonia. If this is omitted, and the elixir allowed to remain slightly acid, it is miscible in all proportions with water and will keep well.—*Amer. Journ. Pharm.*, Sept., 1906, 420.

EMPLASTRA.

Plasters—Novel Method of Spreading.—E. Cruse recommends a novel method of spreading plaster masses, which depends on the transfer of the plaster mass spread on a non-adhesive surface on to another (adhesive plaster) to which it adheres permanently—the selection of the non-adhesive surface depending on the character or composition of the plaster. Thus,

Empl. Cantharid. Ordin. (G. P.), after making it plastic by kneading with the fingers, is spread by means of the thumb upon unsized paper, the desired dimensions being determined by a frame of zinc or tinned iron. The spread plaster is then cut out of the frame with a knife and laid with its surface down on a sheet of ready-spread adhesive plaster sufficiently large to leave a suitable margin after the transfer is made. The under

(cloth) surface of the adhesive plaster is then heated rapidly passing it over a flame, and when sufficiently warmed the cantharides plaster is pressed on with the fingers. The paper covering the latter is then readily removed after moistening it with benzin by the aid of tuft of cotton. For the transfer of

Lead and Resin Plasters, however, the method must be modified by using *smooth parchment paper* instead of ordinary unsized paper. The melted or semiliquid plaster mass being spread upon this and cut out of the frame, the plaster is immersed in water heated to about 35° C., which softens parchment paper and permits its subsequent easy removal. The plaster surface, after wiping off the water, is then laid upon adhesive plaster, which is warmed as in the previous case, and pressed on with the hands. The moist parchment paper is then readily drawn off, leaving a surface of the desired plaster mass exposed.—Pharm. Ztg., li, No. 82 (1906), 907.

EMULSA.

Emulsions—Proposed Additions to the G. P.—Franz Wipperfurth suggests in the interest of uniformity in the practice of dispensing that the text on emulsions in the German Pharmacopœia be expanded so as to include emulsions of camphor, of creosote carbonate, of castor oil and of cod-liver oil.

Camphor Emulsion should be made by using three times as much each of gum arabic and sugar as the prescribed quantity of camphor, mixing the powders intimately and then effecting the emulsion with the prescribed fluids. On the other hand,

Castor-Oil Emulsion requires only one-fourth as much gum arabic as the prescribed quantity of oil. This is important to know, since the use of larger quantities of gum diminishes the purgative action of the oil.

Creosote-Carbonate Emulsion should be made by heating the prescribed quantity of creosotal on a water-bath until it has become thin-fluid, and then emulsionizing it with one-half its weight each of gum arabic and water or prescribed fluid, and then adding the remainder of the prescribed fluid. The addition of almond oil or olive oil, which has been recommended, is superfluous, a perfect and stable emulsion being obtainable under the conditions mentioned. The formula for

Cod-Liver Oil Emulsion in the supplementary volume of the G. P. is too complicated to merit recommendation. A very satisfactory method is the following: An intimate mixture of 4.0 powdered tragacanth and 4.0 powdered gum arabic is placed into a tared 400 Cc. flask, 170.0 distilled water added, and shaken until a homogeneous mucilage is formed. Then add 150.0 cod-liver oil, in three equal portions, shaking vigorously after each addition, and when emulsification is effected, add the other ingre-

dients—such as glycerin (50.0), flavors, etc. • If salts are prescribed, such as hypophosphites, for instance, these should be dissolved in the water before adding it to the gum.—Pharm. Ztg., li, No. 73 (1906), 806.

Emulsion of Petroleum N. F.—Modification of Formula.—Prof. Wilbur L. Scoville considers yellow petrolatum better for making emulsion of petroleum than white. It makes a more creamy emulsion. To make it succeed commercially some calcium and sodium hypophosphites should be added.—Drug. Circ. April, 1907, 294.

Emulsifying Oils—Advantage of the "Continental Method."—J. K. Williams says that the emulsification of oils, especially essential oils, seems to give much trouble, but there is not the slightest difficulty with these if the proportions and procedure of the "dry" or so-called continental method are followed, using a perfectly dry mortar of sufficient size to hold the entire finished product. To one ounce of oil use a half-ounce of acacia and 6 drachms of water. He has found, however, that the addition of at least one-eighth its bulk of some fixed oil, like olive oil, to such essential oils as those of turpentine, wintergreen, etc., will assist very materially in the rapidity of emulsification. But the operator should always preserve the proportion of acacia to the entire quantity of oils and of water. Separate, clean graduates must be used for both the oil and the water. In making emulsion of cod-liver oil, 25 per cent. of gum is sufficient, and the water in the first instance again must be in the proportion of one-half the oil and gum combined. "After this thick emulsion is formed," he says, "you can then add a barrel of water if desired without loss of form. There is no utensil to make the larger emulsion with that equals the old style of a churn." Bull. Pharm., July, 1906, 301; from Proc. Connecticut Pharm. Assoc., 1906.

EXTRACTA.

Solid Extracts—Preparation with Methyl Alcohol.—While the preparation of fluidextracts and other liquid preparations of vegetable drugs with methyl alcohol is out of the question, owing to the poisonous nature of the solvent, L. Rosenthaler's experiments and results seem to point out that methyl alcohol may well serve for the preparation of certain solid (dry) extracts, although not available in all cases, as is shown by the results in the following table:

	Quantity of drug.	Yield.		Alkaloidal Content.	
		Ethyl alcohol.	Methyl alcohol.	Ethyl alcohol.	Methyl alcohol.
Extr. Rhubarb	25.0 Gm.	8.7 Gm.	7.0 Gm.	—	—
Resin Jalap	25.0 Gm.	3.2 Gm.	4.0 Gm.	—	—
Extr. Cinchona	100.0 Gm.	20.6 Gm.	20.1 Gm.	14.8 per cent.	14.5 per cent.
Extr. Nux Vomica, a. . .	100.0 Gm.	9.2 Gm.	8.8 Gm.	20.75 per cent.	16.0 per cent.
Extr. Nux Vomica, b. . .	100.0 Gm.	9.0 Gm.	8.6 Gm.	—	—

—Pharm. Ztg., lii (1907), No. 28, 291; from Südd. Apoth.-Ztg., 1907, No. 22.

Solid Extracts—Method of Removing from Paper after Weighing.—J. T. Davison observes that when dispensing the old-style (moist) solid extracts, as still occasionally happens, it is customary to balance two pieces of paper upon the scale pans and deposit the extract upon one of them. After which the trouble begins, for in the effort to remove the extract from the paper it frequently is the case that portions of the paper are removed as well. This may be avoided by placing a few drops of water upon a pill tile, if the extract be hydro-alcoholic, as the extracts of taraxacum, hyoscyamus, etc., or alcohol, if it be an alcoholic extract, as extract of cannabis indica, and then placing upon the drops the piece of paper containing the extract. This should be allowed to remain a few moments, or until the solvent has penetrated the paper, when the extract may be removed with the greatest facility.—Drugg. Circ., May, 1907, 347.

Extractum Aloes G. P.—Conditions Determining Variations in Solubility.—M. Lefeldt having pointed out (Ber. d. D. Pharm. Ges., 1906, No. 8,) that extract of aloes prepared according to the official (G. P.) directions does not dissolve *nearly clear* in water, but produces a *turbid* solution the "Südd. Apoth.-Ztg" (1907, No. 8,) observes that this statement cannot be accepted unconditionally. Thus, it is found that 1 part of extract of aloes, prepared by the pharmacopœial method, forms a clear solution with 4 parts of cold water, and that this solution remains almost perfectly clear if diluted with water to 7 or 8 parts, but becomes turbid in the further addition of water. The pharmacopœia is therefore at fault in not defining the proportions, as well as the temperature, necessary to secure a clear solution. Indeed, temperature, concentration, and the time during which the aqueous extraction of the aloes is permitted to stand and deposit resinous matter, are important factors. Good aloes will yield an extract soluble in 9 parts of cold water to form a nearly clear solution, if the infusion is allowed to deposit in a cool place for two days,

as officially required ; but an extract *soluble in all proportions* is obtained if good aloes is dissolved, contrary to the official directions, in 12 parts of *boiling* water and the infusion is then set aside for at least two days in as cool a place as possible. Such an extract is comparatively free from resin, and therefore more perfectly soluble in water.—Pharm. Ztg., lii, (1907), No. 10, 96.

Narcotic Extracts—Valuation.—H. Matthes and Otto Rammstedt make a valuable contribution to the methods for the valuation of narcotic extracts, in which they give the results of their experience with the method recommended by H. Thoms (1903) for the determination of the alkaloidal content of such extracts with potassium-bismuth iodide, and of the tannins, particularly in extract of belladonna, by means of potassium permanganate. The authors found the method for determining the alkaloid quite satisfactory, but for pharmaceutical determinations too circumstantial. Their results with the permanganate method for the determination of tannins, however, were not so satisfactory, since the precipitation of the latter by means of ammonium sulphate is incomplete, and the permanganate number consequently indicates only the amount of tannin contained in the ammonium sulphate precipitate. Moreover, the tannin content, even if it were accurately determined, is no criterion of quality, since tannin varies in belladonna with the locality of its growth.—Pharm. Ztg., li. No. 93 (1906), 1031.

Malt Extracts—Examination of Commercial Samples.—E. F. Harrison communicates the results of examination of 13 different samples of malt extract which he made in conjunction with the late Mr. D. Gain. The methods of ascertaining the amount of total solids, of maltose, of diastase, and of total nitrogen (proteids) are described in some detail. Remembering that malt extract is a food rather than a medicine, and should contain more than half its weight of maltose, as well as certain proportions of the nitrogenous constituents of the grain and unaltered diastase, the following results are interesting :

Sample.	Total Solids per cent.	Maltose per cent.	Proteids per cent.	Diastatic Value.	Remarks.
I....	73.2	65.4	7.0	468	—
II....	79.8	64.4	5.0	346	—
III....	69.8	58.5	4.1	356	—
IV....	77.0	54.0	3.6	10	—
V....	72.3	52.1	3.8	15	—
VI....	95.9	82.1	5.7	89	Solid extract.
VII....	76.8	66.0	5.4	96	—
VIII....	74.3	62.5	5.2	65	Considerable salicylate present.
IX....	73.0	47.1	3.8	17	9.5 per cent. of cane-sugar present.
X....	66.2	49.7	3.9	0	—
XI....	78.7	74.2	5.5	268	High maltose figure probably due to glucose.
XII....	64.9	58.8	3.9	0	—
XIII ...	73.9	63.6	6.6	137	—

—Trans. Brit. Pharm. Conf. (Year-book of Pharmacy), 1906, 278-284.

FLUIDEXTRACTA.

Fluidextract of Cascara Sagrada U. S. P.—*Alcohol Content in the Finished Product.*—The Committee on Adulterations of the Ohio State Pharmaceutical Association having reported variable percentages of alcohol in commercial samples of fluidextracts of cascara sagrada, ranging from 17.25 to 36.05 per cent. Joseph Feil has made a fluidextract in strict conformity with the U. S. P., and determined the percentage of alcohol in the product by Allen's method. Using a ground cascara bark containing 6.82 per cent. of moisture and a menstruum composed of 40 vols. of alcohol and 60 vols. of water, the finished fluidextract contained 29.57 per cent. of alcohol. The dry extractive obtained from 100 Cc. of the fluidextract by evaporation weighed 21.60 Gm. and measured when re-dissolved in the the same menstruum 11.40 Cc. Theoretically the fluidextract should have contained 30.54 per cent. of alcohol, the slight loss (0.57 per cent.) being probably due to evaporation during the moistening and packing of the drug. Commenting on the causes of variations observed in the alcoholic strength of the fluidextracts, the author considers it probable that three of them containing respectively 33.50, 34.30 and 36.0 per cent. alcohol were made by the formula of the U. S. P., 1890, with diluted alcohol; three others, containing 24.85, 25.40 and 25.70 per cent. alcohol, were made with a mixture of 1 vol. of alcohol and 2 volumes of water, and two, containing respectively 17.25 and 18.10 per cent. of alcohol, were undoubtedly made with 1 vol. of alcohol and 3 vols. of water. Only one of the fluidextracts appeared to have been made with the menstruum now official; this was reported to contain 29.40 per cent. alcohol. The lesson to be learned, however, in this connection is that the alcoholic content of a fluidextract can not be the same as that of

the menstruums in any case, and that the percentage found depends upon the moisture in the drug, the volume of the extractive, and a certain, though small, loss unavoidable in the best process of manufacture—Proc. Ohio State Pharm. Assoc., 1906, 48.

Fluidextract of Cinchona—Improved Method of Preparation.—The following process for preparing a clear fluidextract of cinchona, miscible with water, and resembling in all other respects the so-called "Extractum Chinæ, Nanning," is recommended by Desmazières: Cort. chinæ pulv., 100 Gm.; acid. hydrochloric dilut. (12.5 per cent. HCl), 12.0 Gm.; glycerinum, 20.0 Gm.; alcohol (90 per cent.), 10.0 Gm.; aqua, q. s. The powdered cinchona is mixed with 400 Gm. of water, to which the glycerin and hydrochloric acid have been added, and the mixture is allowed to stand 24 hours at the ordinary temperature. It is then transferred to a percolator, the liquid portion allowed to percolate, and the percolation is continued with water until 2 drops of the percolate no longer give a precipitate with 4 drops of a 20 per cent. soda solution. The united percolates are then evaporated at not exceeding 80° C. to 90 Gm. and the alcohol (10 Gm.) is added and well mixed. So obtained, the fluidextract has the sp. gr. 1.116, yields 38.9 per cent. of residue (including glycerin) when evaporated to constant weight (corresponding to 19 per cent. of dry extract.), and contains 4.57 per cent. of alkaloid.—Pharm. Ztg., li, No. 94 (1906), 1043; from Bull. d. Scienc. Pharmacol., 1906, No. 10.

Fluidextract of Squill—Formula of 1900 not an Improvement.—Pharmacological experiments made by Dr. E. M. Houghton lead him to conclude that acetic acid is not so satisfactory a menstruum as alcohol for making a fluidextract of squill. The therapeutic results obtained from the use of fluidextract of squill (United States Pharmacopœia, VIII) will be variable, and considerably less than would be expected from the use of the 1890 preparation. It would seem desirable that physicians in prescribing squill should indicate that they desire the preparation of the United States Pharmacopœia, 1890, when they wish to obtain the usual therapeutic action of squill."—Bull. Pharm., Dec., 1906, 522.

Liquid Extracts, B. P.—Unification of Methods of Preparation—D. B. Dott calls attention to the variety of the official (B. P.) methods for preparing liquid extracts. There could be no objection to the multiplicity if a real advantage were in each case gained; but he maintained that it is unnecessary, and, on the whole, to be deprecated. He would use 60 per cent. alcohol, with simple percolation, or maceration and pressure, as required, in nearly every case. Thus he finds that

Belladonna Root is more readily exhausted by 60 per cent. than by 80 per cent. alcohol. The powder, being of a bulky, spongy nature, does not favorably lend itself to re-percolation. It is better to macerate and press.

Cinchona Bark is much more readily extracted by 60 per cent. spirit

than by the official menstruum. In this case it is well to add one per cent. hydrochloric acid with the first maceration, distil off the spirit, and make up to the volume indicated by the alkaloidal assay, using one-teenth volume of glycerin and one-fifth volume of alcohol.

Hydrastis Rhizome is better extracted by 60 per cent. alcohol than with the official 45 per cent.

Ipecacuanha readily yields its alkaloids to 60 per cent. alcohol. The treatment with lime is in this method wholly superfluous. After practical exhaustion with 60 per cent. spirit, addition of lime and percolation with strong spirit gave the merest trace of alkaloids.

Nux Vomica, when in a properly-prepared coarse powder, gives up its alkaloids as readily to 60 per cent. as to 70 per cent. alcohol, and with the distinct advantage that less oil is extracted by the weaker spirit.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1906, 299-301.

Liquid Malt Extract—Utility as a Vehicle for Medicines.—Henry Rodwell makes some practical suggestions concerning the utility of a liquid malt extract as a vehicle for certain medicaments, such combinations usually finding favor with patients. The one drawback lies in the fact that such combinations are liable to form deposits, on which account it is questionable whether potent drugs should be exhibited in combination with it; and even with the less potent remedies, directions should be given for shaking the combination before use. The ordinary malt extract, which usually has a density of 1.375 or over, is not convenient for this purpose, and he therefore suggests a "liquid extract" obtained by incorporating 68 parts of the extract of malt (sp. gr. 1.375) with a previously prepared mixture of 7.5 parts of 90-per cent. alcohol and 25 parts of distilled water, and then adjusting the whole by addition of sufficient water to produce 100 parts of product. After standing until clear, the liquid is decanted or syphoned from the deposit formed and is ready for use, the following formula being recommended:

MALT AND CASCARA.

Extract of cascara sagrada	2.00
Glycerin	} of each a sufficient quantity.
Distilled water	
Liquid extract of malt, a sufficient quantity to produce	100.00

Triturate the extract of cascara with sufficient water containing 25 per cent. of glycerin until a syrupy liquid is obtained, then mix with the liquid extract of malt to produce 100.

MALT AND HÆMOGLOBIN.

Hæmoglobin.....	12.50
Liquid extract of malt, a sufficient quantity to produce	100.00

Triturate the hæmoglobin with a small quantity of the liquid extract till quite smooth, and mix with the remainder.

MALT AND HYPHOPHOSPHITES.

Calcium hyphosphite	0.50
Sodium hyphosphite	0.50
Hypophosphorous acid (30 per cent.)	0.10
Distilled water	5.00
Liquid extract of malt, a sufficient quantity to produce	100.00

Dissolve the calcium hyphosphite and hyphophosphorous acid in 4 parts of the water, and the sodium hyphosphite in the remainder. Mix the two solutions with sufficient of the liquid extract of malt to produce 100.

MALT AND GLYCEROPHOSPHATES.

Potassium glycerophosphate	1.00
Sodium glycerophosphate	1.00
Distilled water, a sufficient quantity.	
Liquid extract of malt, a sufficient quantity to produce	100.00

Dissolve the glycerophosphates in sufficient distilled water to produce a syrupy liquid, and mix with the extract.

MALT AND IRON.

Iron and ammonium citrate	0.85
Distilled water	1.00
Liquid extract of malt, a sufficient quantity to produce	100.00

Dissolve the iron and ammonium citrate in the water, and add to the liquid extract.

MALT AND PANCREATIN.

Pancreatin	2.00
Distilled water, a sufficient quantity.	
Liquid extract of malt, a sufficient quantity to produce	100.00

Triturate the pancreatin with sufficient water to form a syrupy liquid, and mix with sufficient of the liquid extract to produce 100.

MALT AND PEPSIN.

Pepsin	5.00
Distilled water, a sufficient quantity.	
Liquid extract of malt, sufficient quantity to produce	100.00

Triturate the pepsin with sufficient water to form a syrupy liquid, and mix with sufficient of the liquid extract to produce 100.—Pharm. Journ., April 13, 1907, 452.

GELATINA.

Glycerinated Gelatin—Manipulation.—As a practical addition to the U. S. P., VIII, directions for preparing glycerinated gelatin, Elmer E. Scatchard recommends that instead of allowing the mass to cool in the dish, from which it is removed with considerable difficulty, it be poured upon

glass plates, slightly coated with liquid petrolatum. After cooling, it may be removed without difficulty and cut into pieces for preservation in the stock bottle.—*Amer. Journ. Pharm.*, Sept., 1906, 419.

GRANULATA.

Granular Effervescent Preparations—Practical Suggestions.—Reporting to the Pharmaceutical Society of Great Britain on investigations concerning granular effervescent preparations, undertaken at the request of the Pharmacopœia Committee of the General Medical Council, George Lunan makes some interesting observations and suggestions concerning the following questions: 1. Whether this mode of exhibiting medicaments is holding its place in prescriptions? 2. Whether the B. P. examples should be added to, amended, or deleted? 3. Whether this class of preparations does not now warrant them being arranged consecutively, and a monograph giving a general process of preparation under the appendices would not better fulfil the requirements of the B. P. To the first of these questions he replies substantially that these preparations are prescribed at the present time about as frequently as in the past. To the second that, while certain amendments of the formulas—mentioned in some detail—are desirable, on the whole the number of these preparations might with advantage be increased and that deletions are neither necessary or desirable. The third question is answered in the affirmative. It would be a great advantage in saving space and in conciseness of statement, to give this class of preparations in consecutive form with the ingredients, leaving the manipulative process for all to one monograph in the appendices. There need be no special process for any one preparation, except the intelligent reading and use of it for the various preparations, and the author therefore proposes to put the details of the manipulative process of the official effervescent granules under the appendices as follows:

Effervescent Granules—General Process of Preparation.—Mix the sodium bicarbonate, the sugar or glucoside, and the medicament when present, pass them through a No. 20 to No. 30 incorrodible sieve, subject the acids previously mixed to the same process, and thoroughly mix the two sifted powders. Place the mixed powders in layers on a suitable dish, pan or glass tray, heated to between 75° C. to 85° C. if required, but not to exceed the latter temperature. When the mass by means of proper manipulative kneading and compression has assumed a uniformly plastic condition, suitable for granulation, rub it through a No. 5 to No. 10 incorrodible sieve according to the size of granule desired and most adapted to the special effervescent preparation. Dry the granules at a temperature not exceeding 50° C. The products should weigh 100 oz. (or 1,000 Gm.).

The general process is then referred to in the consecutive formulas given in alphabetical order in the B. P., as per example in the following new granular preparation, proposed by the author as a basis for any medicament, and particularly those required without sugar:

Granula Effervescentes pro Base (Effervescent Granule Basis).—

	Imperial.	Metric.
Sodium bicarbonate, in dry powder.....	55 oz.	550 Gm.
Tartaric acid, in dry powder... ..	26½ oz.	265 Gm.
Citric acid, in powder from uneffloresced crystals..	21 oz.	210 Gm.

Prepare according to the process given under "Effervescent Granules" in the appendices. The product in this case only should weigh about 95 oz. or (or 950 Gm.).

In addition to this new preparation, the author recommends two others, namely effervescent granules of iron and ammonium citrate, and of potassium citrate; while under the headings of the effervescent granules now official in the B. P. the amendments considered necessary to their perfection are mentioned in detail.—Pharm. Journ., Dec. 15, 1906, 665-668.

Granular Effervescent Salts—Preparation Without Heat.—J. J. Barnett discusses the relative merits of the official American and English methods for the preparation of granular effervescent salts, by one of which the products found on the market are doubtless prepared. The present U. S. P. method, which differs materially from the method of 1890, consists in mixing the material with an effervescent base, composed of citric and tartaric acid and sodium bicarbonate. This mixture is heated to about 100° C., when it becomes moist, is then pressed through sieves of the proper size, and the granules are dried at a lower temperature (about 50° C.). In the "English" method only tartaric acid is used; sugar is added, and the granulation is effected by the aid of alcohol. The advantages are that no heat is necessary to effect granulation, and that the salt is more palatable; the disadvantages that, owing to the presence of sugar, the salt will discolor, whereas the salt granulated with citric acid and heat is perfectly white and firm. The solubility of the two kinds is about the same. The author gives preference to the "English" method, but objects to the sugar because of the resultant discoloration. In his opinion heat should be avoided, but this is hardly practicable if large granules are required, for which citric acid granulation is necessary. In the case of smaller granules he suggests tartaric acid with a small portion of citric acid, but without sugar, and moistening with a mixture of alcohol and the smallest possible quantity of syrup.—Proc. Maryland Pharm. Assoc., 1906, 86-89.

Granular Effervescent Salts—The Formulas of the U. S. P. VIII an Improvement.—Wm. J. Lowry, Jr., finds the fusion method adopted in the U. S. P. VIII an improvement over the old method, but offers some practical suggestions which will further facilitate and improve the manipulation. Stirring during the heating of the mixture, as directed, should be avoided, the best granules being obtained when the mixed ingredients remain undisturbed until they are removed for granulation. He recommends that the mixture be spread on a sheet of manilla paper to a depth of ¼

to $\frac{3}{8}$ inch, and then exposed on a suitable tray to a temperature of at least 100° C., but not above 103° – 104° C., until it has fused to the consistency of a dry quinine pill mass. On lifting the paper by the diagonally opposite corners, two at a time, the mass will form a ball in the middle of the sheet, which can be readily removed to the sieve, through which it must be passed without a moments delay. The granules are then dried for about 5 hours at 50° to 55° C., and immediately bottled.—Proc. Maryland Pharm. Assoc., 1906, 89–90.

Granular Effervescent Salts—New Method of Manufacture.—J. Percy Remington has devised a method for the manufacture of granular effervescent salts by which a uniform granulation is effected expeditiously with a minimum loss of effervescent properties. To accomplish this, he uses a No. 6 sieve of galvanized wire, mounted on a frame in such a way as to permit a solid bottom to be inserted, an ordinary pie roller completing the apparatus. After preparing the mixture in the usual manner, it is spread uniformly on the sieve while the bottom is in place. The sieve is then placed in a hot closet or oven at the proper temperature and when the mass has begun to soften and the liberated water of crystallization has thoroughly moistened the mass, it is removed and the frame placed over a receiving box. The pie roller is then passed over the mass and thus forces the mass through the sieve so as to form uniform granular particles.—Proc. Penna. Pharm. Assoc., 1906, 144.

INFUSA.

Infusion of Digitalis—Rapid Deterioration Dependent on Acidity.—J. Löwy states that the activity of infusion of digitalis leaves is diminished by the action of hydrochloric acid in the fluids of the stomach, and not by the pepsin content as heretofore assumed. He finds, moreover, that after simply standing 24 hours at the ordinary room temperature, the infusion loses one-half its original activity, and traces this change to the influence of an organic acid present. If this is neutralized, this unfavorable change is prevented.—Pharm. Ztg., li, No. 97 (1906), 1074; from Wien. klin. Wschr., 1906, 1157.

Infusion of Senega, B. P.—Precipitation Prevented by Sterilization.—Archibald Currie's experiments point out that sterilized infusion of senega will keep at ordinary temperature without precipitation. When not sterilized the concentrated infusion will soon precipitate copiously. If the sterilized infusion is inoculated with cultures obtained from this precipitate, it will show marked signs of precipitation within a few days, whereas another portion of the same sterilized infusion not inoculated shows no such change.—Pharm. Journ., March 23, 1907, 359.

Infusum Sennæ Compositum—Methods of Clarification and Preservation.—The adoption of a cold process of preparation for compound in-

fusion of senna in the new Austrian Pharmacopœia, and that depending on the simple admixture of fluidextracts of the drugs with the other ingredients, previously adopted in the Belgian Pharmacopœia, has given rise to considerable discussion during the past year, concerning the most reliable methods of securing a stable preparation. Reviewing the various suggestions that have been offered, the "Pharmaceutische Zeitung" observes that in nearly all cases practical observers lay great stress on the necessity of careful clarification, not so much on account of its improved appearance, but because it is a common experience that a perfectly-clear preparation will keep longer than a turbid infusion. If then, in addition, the finished preparation, made as directed in the G. P., is filtered and pasteurized by heating for one hour at 80° C., the infusion should keep well for months in a cool place if the bottles are filled and well corked. As to the method of clarification, the suggestions are numerous. Weill recommends shaking with kieselgur (1 or 2 tablespoonfuls to 5 liters) before filtration; Scheinert regards paper pulp as the best filter medium; Wippert recommends fresh egg white, added to the cooled infusion, heating to boiling and straining; and, finally, Schnabel takes advantage of the clarifying effect of a current of carbonic acid, generated from a calculated quantity of acid potassium tartrate and sodium carbonate, which replaces a corresponding quantity of the potassium and sodium tartrate required in the official (G. P.) formula. This treatment effects the rapid formation of a deposit, from which the clear liquid is decanted and immediately transferred to dry bottles.—Pharm. Ztg., lii (1907), No. 5, 48.

Effervescent Compound Infusion of Senna—A Stable Preparation.—E. Stütz recommends the introduction of carbonic acid into the compound infusion of senna, G. P., as an efficient preservative. Using the proportions of senna, water, Rochelle Salt* and manna (omitting the alcohol and sodium carbonate) necessary for 1000 Gm. of the infusion, this is prepared according to the official (G. P.) directions. It is then *filtered* and the clear filtrate is divided into 5 bottles, each containing 2.7 Gm. of potassium bitartrate and 1.2 Gm. of sodium bicarbonate. These are well corked, wired and preserved in a cool cellar.—Apoth. Ztg., xxi, No. 87 (1906), 931.

LINIMENTA.

Linimentum Ammonia, B. P.—Manipulation.—The ammonia liniment of the B. P. is directed to be made by shaking together 1 fl. part each of solution of ammonia and almond oil, and 2 fl. parts of olive oil. A. J. Ramage finds that if the solution of ammonia is added to the oils previously mixed, or first shaken with the olive oil and then the almond oil, a liniment of a buttery consistence results which can with difficulty be

* Using only 80 per cent. of the prescribed quantity of Rochelle salt, the remainder being formed by the potassium bitartrate and sodium bicarbonate used for liberating CO₂.

poured ; but if the almond oil and solution of ammonia be first mixed and the olive oil afterwards added, a much more fluid liniment is obtained.—Pharm. Journ., March 9, 1907, 287.

Camphor Liniment (Oleum Camphoratum, G. P.)—Preparation.—Unger recommends the preparation of camphorated oil without the aid of heat, so as to avoid the loss of camphor occasioned by vaporization when heat is employed. This precaution is criticised as being unnecessary if the heating is conducted in a closed vessel. No loss of camphor results if the components are introduced into a dry bottle and, after securely stoppering, heating this in water warmed to 40° C. or by placing it into a heating apparatus, until, after shaking occasionally, the camphor is dissolved.—Pharm. Ztg., ii, Nos. 103/104 (1906), 1140 ; from Südd. Apoth. Ztg., 1906, No. 10.

Camphor Liniment—Preparation.—Jacob Diner says that he makes camphorated oil by means of the circulatory displacement method. Putting the camphor gum in a gauze bag, he suspends it in the cottonseed oil. In a few hours it is all dissolved, new portions of the oil constantly arising to the camphor as the heavier saturated portions fall to the bottom. This method is also very useful in making mucilage of acacia, tincture of iodine, and many other products.—Bull. Pharm., March, 1907, 129.

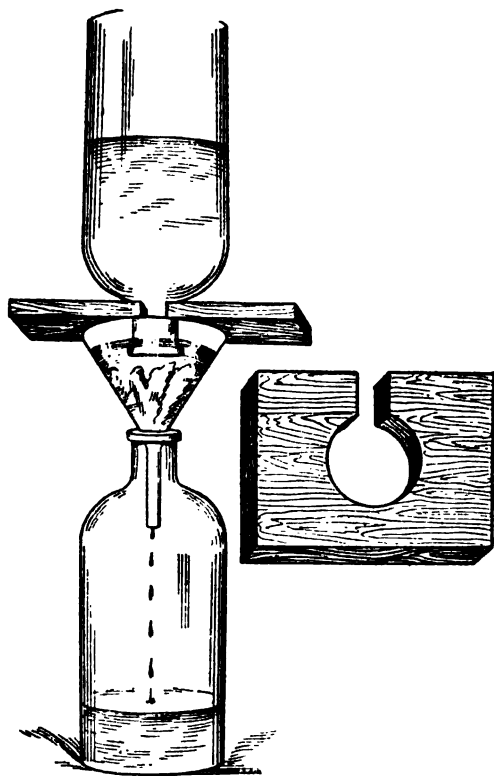
Soap Liniment—Manipulation.—L. D. Havenhill suggests a return to the method of manipulation directed in the U. S. P., 1890, which, if the ingredients are of proper official quality, will insure an identical preparation in the hands of different operators, whereas, when manipulating according to the U. S. P., VIII, the personal equation has to be taken into account. Furthermore, in the process of 1890 the manipulative details are reduced to a minimum. After careful review of the shortcomings of the formulas for this liniment which have been official in the U. S. P. since 1820, the author finds the formula of 1900 and the manipulation of 1890, as here modified, to be most satisfactory :

Dried soap, in thin shavings ($\frac{1}{8}$ Mm.)	60 Gm.
Camphor, in small pieces.	45 Gm.
Oil of rosemary	10 Cc.
Alcohol	725 Cc.
Water, enough to make	1000 Cc.

Introduce the alcohol into a graduated bottle, add the oil, camphor and soap, dilute to the liter mark with water, cork the bottle, and shake it thoroughly. Incline the bottle sufficiently to allow the undissolved particles to remain in the elevated end of it and dissolve by circulatory solution. After twenty-four hours filter through paper in a covered funnel. This is conveniently accomplished by the use of a thin board of sufficient size to cover the top of the funnel, having a notched hole large enough to admit

the neck of the inverted container so that the delivery will be below the level of the top of the filter paper, which will prove a great saver of time, labor and filter paper. The bottle is inverted in the funnel and then the board slipped under to support it. The accompanying cut (Fig. 28),

FIG. 28.



Filtration of Soap Liniment.

shows the manner of using it so clearly as to make further explanation unnecessary.—*Drug. Circ.*, July, 1906, 245.

Arnica and Witchhazel Lotion—Simple Formula.—Criticising a formula for arnica and witchhazel lotion recently recommended, which contains quite a heterogeneous variety of ingredients, Paul Caldwell recommends the following simple formula as fulfilling all requirements: Tincture of arnica, 8 ozs.; glycerin, 4 ozs.; witchhazel water, 1 gallon.—*Drugg. Circ.*, July, 1906, 241.

"Queen Balm"—*A Number-one Liniment for Man and Beast.*—A. F. Magoffin has used the following formula for making a liniment which has been on the market under the name of "Queen Balm" since 1869, and

has proven very satisfactory for bruises, sprains, frostbites, rheumatism, etc. :

Camphor.	2 ounces.
Myrrh	2 ounces.
Guaia.	1 ounce.
Capicum	2 ounces.
Oil of sassafras	1 ounce.
Oil of hemlock	1 ounce.
Alcohol.	1 gallon.

Macerate, with occasional agitation, for seven days, then filter. Apply freely to all parts affected, "warming it in" well with warm flannel.—*Drugg. Circ.*, May, 1907, 348.

LIQUORES.

Solutions of the National Formulary—Suggestions Concerning Manipulation.—Professor Wilbur L. Scriville, who may be considered an authority on preparations of the National Formulary, has the following to say concerning several N. F. Solutions :

Alkaline Antiseptic Solution is regarded by some to be too sweet, and they accordingly have cut down the glycerin to half that directed in the formula, to correct this trouble. It is not the glycerin, but the flavor that needs correcting. Keep the glycerin as it is in the formula, but use twice as much eucalyptol, and add 15 Cc. of compound tincture of cardamom, and the sweet effect will disappear, while the aromatic quality will be improved. Magnesium carbonate is a better clarifying agent for this than purified talc.

Solution of Ferric Oxychloride.—Too much exposure of the precipitate first formed will spoil this preparation. It is important that the ammonia water shall be of full strength (over-strength will do no harm) and that the full amount of diluting water be used. Then the iron solution must be added to the ammonia solution, and not vice versa. The washings of the magma should be as rapid as possible (usually two decantations per day, at morning and at night) and the water used should be as free as possible from dissolved air or gases. Finally squeeze all the water possible from the precipitate and thoroughly mix the hydrochloric acid with it. Too much or too strong an acid will make a lighter colored preparation, not as useful for the particular purposes of this solution.

Solution of Iron Albuminate.—The preparation of this requires careful work, particularly in neutralizing the mixture of egg albumen and solution of ferric oxychloride. The addition of the alkali must be made very cautiously, and an excess carefully avoided to obtain a precipitate that can later be redissolved. A very slight excess of the precipitant will cause trouble. This flocculent precipitate must next be washed with the least

possible exposure to air, and then be pressed lightly to rid it of the excess of water. If all this is skillfully done the magna will dissolve in the solution of sodium hydroxide quickly, and yield an almost clear solution. The preparation is, however, more easily made with twice the quantity of egg albumen directed, and when so made a clear solution is more likely to result.

The same principles apply to the *Solution of Iron Peptonate*.

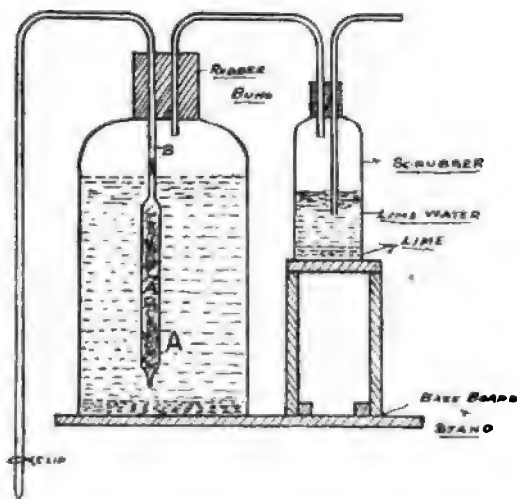
Essence of Pepsin.—The angelica wine in this preparation should not be fortified, but should be as low in alcohol as possible to ensure an active preparation. Ten per cent. of alcohol in the finished preparation is better than 15, because the pepsin will be more active.—*Drugg. Circ.*, April, 1907, 294.

Liquor Ammonii Anisatus, G. P. IV—Inconvenience Occasioned by the Official Substitution of Anethol for Oil of Anise.—The Apotheker Zeitung calls attention to the inconvenience occasioned by the adoption of anethol in the G. P. IV in place of oil of anise, and the consequent necessity of its use for the preparation of liquor ammonii anisatus, which, in turn, is used as a constituent of the *Elixir e succo liquiritiæ*, so popular in the cough prescriptions of German physicians. The substitution of the pure crystalline constituent of anise oil in the same quantity as that of the oil formerly official, causes a separation or crystallization of anethol on the reduction in temperature of these preparations, which is particularly disturbing in the case of the elixir of licorice. It is therefore recommended that in these preparations the anethol be emulsionized by means of gum arabic so that it may be retained in permanent suspension.—*Apoth. Ztg.* xxi (1906) No. 59, 613.

Lime Water.—Convenient Arrangement for Preservation.—W. S. Clark suggests the arrangement shown by Fig. 29 for keeping lime water, which requires little explanation except as concerns the syphon filter tube *a*. This is made with a piece of glass tubing, 12 in. long and $\frac{1}{2}$ in. diameter, one end of which is narrowed to a point, the other drawn out to a diameter of $\frac{3}{8}$ in., corresponding with the diameter of the syphon tube *B*, with which it is connected, after loosely filling it with washed asbestos or glass wool, by means of a piece of rubber tubing. The tube *A* when in position serves to filter the liquor from suspended matter, such as small particles of lime; and since the orifice is just above the sediment of lime, a clear saturated solution may be drawn off as required by opening the clip attached to the outer end of the syphon. With this apparatus the necessity to await the clarification of the lime water by subsidence is obviated. The lime water should be prepared in the bottle and allowed to stand a few hours before fitting up the apparatus as shown, so as to allow the greater part of the excess of lime to settle. With regard to the effect of atmospheric carbon dioxide, the author considers this to be comparatively

trifling. The total CO_2 in ten liters of air is not likely to exceed 4 Cc., and this would completely precipitate only 0.013 Gm. of calcium hydroxide.

FIG. 29.



Container for Lime Water.

It suffices therefore to use lime water in the wash-bottle, through which the air passes before it enters the stock-bottle.—Chem. & Drug., Aug. 4, 1906, 231.

Liquor Chlori Compositus U. S.—Instability.—William R. Shearer finds after experiments and analysis that it is impossible, even under the most favorable conditions, to obtain compound solution of chlorine containing 0.4 per cent. Cl as prepared by the U. S. P. formula. Moreover, the more nearly saturated solutions lose Cl more rapidly than weak ones, and he therefore suggests that the strength of the official solution be reduced to 0.1 per cent. Cl, which might be obtained from stronger solutions by dilution on the basis of assay.—Amer. Journ. Pharm., July, 1906, 333.

Solution of Chlorophosphide of Arsenic—Formula.—The following formula for a so-called solution of chlorophosphide of arsenic is quoted by Prof. Francis Hemm from the Standard Formulary (1896):

Arsenous acid	15 grs.
Diluted hydrochloric acid	3 fl. oz.
Distilled water	sufficient.
Phosphoric acid	a few drops.

Dissolve the arsenous acid in the hydrochloric acid and 7 fluidounces of distilled water by the aid of a gentle heat, add the remainder (?) of the water and the phosphoric acid.

Prof. Hemm suggests that the intent of the formula is evidently to make

ten fluidounces of finished solution, but the directions are defective on this point.—Meyer Bros. Drugg., July, 1906, 192.

Compound Cresol Solution—Manipulation.—F. Nitardy finds that the difficulties encountered by some when making the compound cresol solution of the U. S. P., VIII., may be overcome as follows: First warm the mixture of alkali and oil until saponification results, then add the cresol and proceed otherwise as directed.—Bull. Pharm., May, 1907, 208.

Fowler's Solution, G. P.—Partial Conversion of Arsenous into Arsenic Acid.—The German Pharmacopœia provides a test for determining the percentage of arsenous acid in the official Fowler's Solution, which depends on the conversion of the arsenous into arsenic acid and the complete consumption of a specified quantity of $\frac{N}{10}$ iodine solution, using starch as indicator, before the further addition of iodine will produce a blue color. Dr. Rosenthaler, however, finds that the arsenous acid is spontaneously and gradually converted into arsenic acid, and that to the extent of this conversion the preparation must show a deficiency of arsenous acid when the pharmacopœial test is applied. He therefore proposes the admissibility of a certain maximum quantity of arsenic acid, and suggests a simple method of assay by which the arsenous acid is first determined in the usual way; the liquid is then acidulated strongly with HCl or H₂SO₄, potassium iodide is added, and the total arsenic acid determined by titrating the liberated iodine with thiosulphate.—Pharm. Ztg., li, No. 76 (1906), 840.

Solution of Iron Albuminate—Improved Method of Preparation.—At the meeting of German Naturalists and Physicians at Stuttgart (Sept., 1906) Dr. E. Laves read an exhaustive paper on the therapeutic advantage of iron albuminate over other preparations of iron, in the course of which he made some interesting suggestions concerning the preparation and method of testing solutions of iron albuminate. Although failing to give a working formula for its preparation, he mentions that the problem of producing an agreeable, clear, neutral and stable solution of iron albuminate is solved by the use of iron saccharate as a solvent for the iron albuminate in place of solution of sodium hydroxide usually employed for this purpose. The albuminate and saccharate form a combination which can only be separated by the denaturation of the albumen itself. Moreover, it is important that egg albumen be used for the preparation of the albuminate not the blood serum which is commonly used for this purpose by manufacturers. The latter, independent of its undesirable source, frequently contains disease germs, which, owing to impracticability of sterilization, cannot be eliminated.—Pharm. Ztg., li, No. 77, (1906), 850.

Solution of Iron Albuminate—Precautions in Making it According to the "N. F." Formula.—Referring to the observations recently made by Prof. Scoville concerning the proper manipulation in making solution of iron albuminate by the "N. F." formula, H. A. B. Dunning mentions

his own experience with this preparation, which coincides with the observations of Prof. Scoville. He now finds no difficulty in making the preparation when using the following precautions, which are almost identical with those advised by Prof. Scoville: If practicable, dilute before mixing both iron and albumin solutions twice as much as directed by the National Formulary. Add the albumin solution to the iron, not vice versa, and neutralize with sodium hydroxide solution very cautiously. If carefully made, when complete precipitation takes place the mixture will give a very faint acid reaction when tested with litmus. The slightest excess of alkali is to be avoided. The precipitate should be washed rapidly by siphoning off supernatant clear liquid, refilling the container with water, and again siphoning. This can be done, when making 1 gallon, about every fifteen minutes, and four or five times will be sufficient to remove any excess of chloride. After the final siphoning the mixture is poured on a muslin strainer, and when most of the liquid has run through the precipitate is subjected to a gentle pressure to remove as much of the liquid as practicable without forcing the precipitate through the muslin. It is then placed in a suitable container and thoroughly mixed with the solution of sodium hydroxide, when solution will result. The author finds it advantageous, however, if 100 Gm. of fresh albumen be used per 1000 Cc. instead of 40 Gm., as directed in the original "N. F." formula. The time required for making $\frac{1}{2}$ gallon of this preparation, should not exceed three hours.—*Drugg. Circ.*, May, 1907, 374.

Liquor Ferri Hypophosphitis Fortis, B. P. C.—Improved Formula.—Frank Goldby and Horace Finnemore find that in the preparation of the strong solution of ferric hypophosphite B. P. C., there is a loss of ferric salt by the interaction of sodium hypophosphite with ferric chloride, and they therefore recommend the following improved formula which uniformly produces a solution containing the required quantity (40 grains to the fluidounce) of ferric hypophosphite:

		For 10 fl. oz.
Solution of ferric sulphate, B. P.	14.2 Cc.	11 dr. 20 m.
Solution of ammonia	23. Cc.	18 dr.
Citric acid	7.6 Gm.	334 grains.
Sodium Hypophosphite.....	9.6 Gm.	421 grains.
Distilled water,		
Chloroform water (1 in 200), of each a sufficient quantity.		
Sodium Citrate	6.6 Gm.	292 grains.

Dilute the solution of ammonia with an equal volume of distilled water, gradually add the solution of ferric sulphate previously diluted with an equal volume of water, wash the precipitated ferric hydroxide by decantation with distilled water till free from sulphates, collect on a calico filter, drain, and transfer the moist precipitate to a porcelain dish. Add the

citric acid, and 20 Cc. of distilled water, heat over a water-bath, with occasional stirring, until a clear solution results, then add the sodium hypophosphite, and continue to heat over water-bath with stirring for about one minute, or till a clear greenish solution is obtained; lastly add the sodium citrate, filter, and pass sufficient chloroform water through the filter to make the volume up to 100 Cc. The product is very similar—perhaps rather brighter—in color to that obtained by the B. P. C. method, and has the advantage, owing to the presence of the sodium citrate in preventing the formation of a deposit in the compound syrup of hypophosphites B. P. C., for the convenient preparation of which it has been introduced in the “Compendium.”—Pharm. Journ., Feb. 2, 1907, 102.

Concentrated Solution of Iodine—A Convenience for Making the Ointment.—F. P. Robinson suggests the following formula for a solution of iodine which is convenient for preparing iodine ointment extemporaneously:

Powdered iodine.	62 grs.
Potassium iodide.	62 grs.
Glycerin,	
Distilled water, of each to make.....	280 min.

Ten minims of this solution added to one drachm of benzoated lard makes the U. S. P. iodine ointment.—Pract. Drugg., July, 1906, 452; from Bull Pharm.

Iodine-Chloroform—Permanent Preparation.—Chassevant finds that a solution of iodine in chloroform prepared in the proportion of 1 p. iodine to 22.5 p. chloroform retains the iodine in solution even at a temperature of 0° C., while the stronger solution previously recommended as a substitute for the tincture deposits iodine during the ordinary winter temperature.—Pharm. Ztg., li, No. 67 (1906), 748; from Bull. Commenc., 1906, No. 4.

Solution of Magnesium Citrate—A Concentrated Form for Stock.—E. G. Baird recommends a stock solution of magnesium citrate, made three times the normal strength, by dissolving the citric acid in water by the aid of heat, adding the magnesia, and raising the solution to the boiling point. Pour into a stoppered bottle, and when cold add soluble extract of lemon, q. s., and filter. When required for use take one and a half ounces of syrup, four ounces of the filtered solution, and water, q. s., to make a bottle of the solution of magnesium citrate. The author recommends the addition of one-fifth of a grain of benzoic acid to each four fluidounces of the concentrated solution, which will keep it perfectly, but adds that if the benzoic acid is objectionable, the solution made and boiled as directed is very unlikely to spoil.—Proc. Mississippi Pharm. Assoc., 1906, 41.

Solution of Magnesium Citrate—Novel Method of Preservation Ready for Dispensing.—F. S. Nagle recommends a method for preparing solutions of magnesium citrate which presents the novel feature that the bottle and contents, though securely corked and tied over, requires shaking before dispensing so as to disengage the carbonic dioxide necessary to make the solution effervescent. This is accomplished by substituting $1\frac{1}{2}$ fl. oz. of simple syrup and 5 drops of essence of lemon for the (somewhat larger quantity of) syrup of citric acid officially directed, and having placed 30 grains of potassium bicarbonate into the cleaned and dried bottle to pour on first the simple syrup, and then, carefully so as not to mix with the syrup, the filtered aqueous solution of magnesium citrate, flavored with the lemon. After securely corking and tying over, the bottle is placed in a locality which is not too cool (between 40° and 50° F. is recommended), and then only requires brisk shaking when dispensing to bring about the reaction between the potassium bicarbonate and the acid magnesium citrate.—Proc. Penn'a Pharm. Assoc., 1906, 246.

Solution of Lead Subacetate—Inefficacy of the Cold Process of Preparation.—W. S. Thompson has experimented with the so-called cold process, used by some pharmacists instead of the official process for the preparation of solution of lead subacetate. This process consists simply in macerating the lead oxide in a solution of the lead acetate during a period of two weeks or more and decanting the clear solution. The best result obtained was a preparation assaying only 20.712 per cent. (of converted ? Rep.) lead acetate after macerating but 24 hours, while other samples, although macerating a much longer time, gave still lower results.—Amer. Journ. Pharm., Sept., 1906, 416.

Liquor Sodæ Chlorinatæ, B. P., 1898—Defects in the Formula.—R. C. Cowley points out some the defects in the formula and process of the B. P., 1898, for preparing liquor sodæ chlorinatæ, which are principally due to the change in the method of preparation without a corresponding alteration of the proportions in the formula. To arrive at the best possible proportions for preparing a liquor of the strength in available chlorine required by the Pharmacopœia one has to bear in mind the following factors :—

1. The proportion of available chlorine in the bleaching powder.
2. The solubility of the bleaching powder operated on.
3. The quantity of sodium carbonate required to completely precipitate the dissolved lime.
4. The relative proportions of lime and available chlorine dissolved in a definite time.
5. The fact that all solutions of hypochlorites are more stable in an alkaline than in a neutral solution. This appears to have been ignored by the compilers of the two last Pharmacopœias, though practically admitted by

their statement as to the amount of available chlorine in the solution of chlorinated lime and soda.

The practical results of the author's investigation lead him to the conclusion that a solution containing the proper chlorine content would be deficient in keeping qualities owing to the small amount of free alkali, and that consequently the proportions of sodium carbonate might with advantage be increased to double that of the bleaching powder—the quantity now directed being insufficient to precipitate all the lime. The volume of water ordered might also very well be increased, since during the winter months the mixture almost becomes pasty when the sodium carbonate is added to the solution of chlorinated lime. Finally the liquid should be filtered as rapidly as possible, or decanted clear if the precipitate settles fairly rapidly.—Pharm. Journ., Nov. 17, 1906, 540.

Compound Solution of Sodium Phosphate, U. S. P.—Unsatisfactory Formula.—Leo Eliel finds the U. S. P. formula for compound solution of sodium phosphate unsatisfactory. The solution when first made is apparently perfect, but after standing a few days crystals of sodium phosphate will be plentiful on the bottom of the container.—Proceed. Indiana Pharm. Assoc., 1906, 69.

Concentrated Solution of Sodium Phosphate—Formula for a Palatable Preparation.—F. P. Robinson recommends the following formula for preparing a palatable and concentrated solution of sodium phosphate :

Sodium phosphate, anhydrous.....	6½ ozs.
Tincture fresh lemon peel	1 dr.
Phosphoric acid, 85 per cent	2 ozs.
Glycerin	1 oz.
Distilled water, to make	16 ozs.

Dissolve the sodium phosphate in a mixture of the phosphoric acid and the distilled water, and when dissolved add the glycerin and the tincture of lemon peel and filter.—Pract. Drugg., July, 1906, 452; from Bull. Pharm.

Ringer's Solution for Burns—Formulas.—V. Trouenfels communicates the following formulas for preparing Ringer's solutions I and II, which are used subcutaneously in cases of burns, No. II being particularly used in severe cases :

	I.	II.
Sodium chloride	7.5	9.0
Calcium chloride.....	0.125	0.24
Potassium chloride	0.075	0.42
Sodium bicarbonate	0.125	0.3
Distilled water.....	1000.0	1000.0

The solutions must be sterilized.—Pharm. Centralh., xlvii, No. 45 (1906), 935.

Schleich's Solution—New Formulas.—In place of the solutions for producing local anesthesia heretofore recommended by Schleich, which were composed of morphine hydrochloride, cocaine hydrochloride and sodium chloride, the author now recommends the following in which the morphine salt is replaced by alypin :

	I.	II.	III.
Cocaine	0.1	0.05	0.01
Alypin	0.1	0.05	0.01
Sodium chloride	0.2	0.20	0.20
Distilled water	100.0	100.00.	100.00

These solutions reliably produce a nontoxic infiltration anesthesia.—Pharm. Ztg., lii (1907) No. 2, 18 ; from D-Med.-Ztg., 1906, No. 103.

MELLITA.

Oxymel Scillae, B. P.—Criticism.—J. G. Joyce adds another criticism of the official (B. P.) method of preparing oxymel of squill to the many which have in the past preceeded it. He observes that a more definite description is needed for the finished product. It should be stated, to be within certain limits of color ; to contain a definite percentage of acetic acid ; whether it should be clear and bright, or allowed to be opalescent or cloudy : while, to assist the attaining to a fixed standard, more definite instructions are required as to the character of the honey to be used and the amount of same, the insistence of dry squill, and a more definite volume given for the acetum.—Pharm. Journ., June 8, 1907, 744.

MISTURÆ.

Acetic Expectorant—Formula.—Prof. Francis Hemm suggests the following formula for an "Acetic Expectorant" :

R Ammonii chloridi.....	3i
Aceti sanguinarie	} aa 3ii
Aceti lobeliae	
Syrupi scillae.....	f 3i
Syrupi ipecacuanhae.....	f 3ii
Syrupi tolutani, q. s. ad.....	3iv

Sig.—Dose, one or two teaspoonfuls as required every two or three hours.—Meyer Bros. Drugg., July, 1906, 192.

"Eggnog"—*How to Make.*—"Tip," writing in the New York Press, says that although physicians frequently prescribe "eggnog" few are able to give a formula for its preparation, and he therefore supplies the necessary information as follows : "Separate the yolk from the white of an egg. Beat the white till it stands up like Gibraltar. Then beat the yolk, add half a teaspoonful of sugar and a glassful of milk. Pour in half on ounce of whisky and stir. On top put the white, and, if you like, grate a little

nutmeg. If you want a change from day to day substitute for the whisky some good port, sherry, tokay or any first-class wine."—Drugg. Circ., Aug., 1906, 291.

Tasteless Castor Oil—Formula.—Prof. P. E. Hommel, after considerable experimenting found that the following formula yields a preparation which is about all that can be desired as a palatable and transparent castor oil:

Castor oil	4 ounces.
Saccharin	1 grain.
Oil of anise.....,	8 drops.
Alcohol	1 dram.

Dissolve the saccharin in the alcohol by the aid of gentle heat, and add the oil of anise; then agitate well with castor oil.—Proc. N. J. Pharm. Assoc., 1906, 74.

MUCILAGINES.

Mucilage of Gum Arabic—Preservation.—Franz Wipperfurth observes that while the mucilage of gum arabic of the German pharmacopæia is quite unstable under the conditions of the test, it may be well preserved by observing certain simple precautions. It is primarily necessary that the water used shall be freed from air and carbon dioxide. This is accomplished by boiling the water in a flask and after closing this allowing it to cool. The solution of the gum (1:2) is then effected in a flask which should be completely filled, and not by agitation, but by frequently turning or inverting it. The clear mucilage is then transferred into small containers, which must of course be well filled and carefully stoppered.—Pharm. Ztg., li, No. 73 (1906) 807.

Mucilage of Gum Arabic—Sterilization, etc.—See *Sterilized Gum Arabic Under "Materia Medica."*

Mucilage of Acacia—Cinnamon Water a Good Preservative.—Emil Reyer has made experiments to determine the effect of different solvents as preservative agents for mucilage of acacia, using: (1) the official solvent (equal parts of lime water and distilled water); (2) lime water alone; (3) distilled water alone; (4) city water, (hard, but free from organic matter); (5) chloroform water; (6) cinnamon water. With the exception of No. 6, all the samples (which were made from the same gum) became more or less mouldy, the heaviest mould (strange to say! Rep.) being in No. 5. and with exception of No. 2 they all became more or less acid. No. 6 was also acid, but no mould had formed during the period covered by the operation, although it was somewhat darker in color than when freshly prepared, the odor and taste of cinnamon was unimpaired three month after it was made, while the changes observed in the other cases were brought about within periods of two weeks.—Drugg. Circ., April, 1907, 293.

PASTA.

Medicinal Pastes and Powders—Method of Communicating a Flesh Color.—Th. Mayer recommended the coloration of medicinal pastes and powders so as to impart a flesh tint by means of finely levigated red bole and saffron, the following formula serving as an example: Bolus rubra, 0.8; crocus, 0.2; pasta salicylica, 20.0. This produces a *pale* flesh tint. If the saffron is omitted, a *rose* tint is produced. Skin powders, such as talcum, may be similarly treated, using 4 per cent. of the red bole and 1 per cent. of saffron, or omitting the latter if a deeper tint is desired.—Pharm. Ztg., li, No. 67 (1906), 748; from D. Med. Ztg., 1906, No. 60.

Tooth Paste—Reliable Formula.—H. C. Blair recommends the following formula and process for preparing a tooth paste as reliable in maintaining its consistency and satisfactory in quality: Soft soap, 1 oz.; glycerin, 8 oz.; starch, $\frac{1}{2}$ oz.; water, $\frac{1}{2}$ oz.; precipitated chalk, 8 oz.; oil of peppermint, $\frac{1}{2}$ oz.; coloring, sufficient. A glycerite of starch is prepared with the starch, glycerin and water, the soap added, and, with the coloring and flavoring, rubbed into a homogeneous mass. The precipitated chalk, after bolting through a No. 14 bolting-cloth sieve, is then added, and the whole worked into a smooth paste, which is conveniently filled into tubes by the aid of a sausage stuffer. Obviously, the flavoring may be changed for some other, and the coloring may be omitted. A good coloring is carmine color. When mixing large quantities, a mechanical contrivance, such as a bread-mixer or putty machine, is used with advantage.—Proc. Penna. Pharm. Assoc., 1906, 75-76.

PILULÆ.

Enteric Fills—Preparation with Mutton Suet.—W. Jaworski recommends the official suet (sebum ovile, m. p. 47° – 50° , G. P.; sebum praeputum, m. p. 45° – 50° C., U. S. P.) for preparing pills of medicaments which are not intended to become effective until they reach the intestinal tract. Such pills, floating upon water or the contents of the stomach, rapidly reach the intestines without first melting or dissolving in the stomach, but it is important that the suet shall not melt below 45° . Furthermore, the pills must not contain more than 0.1 Gm. of suet each, nor should they contain more than this quantity of the medicament. On the other hand, if the medicament is present in smaller quantities, for instance 0.01 Gm. in each pill, several centigrams of some inert substance, such as powdered licorice root or magnesia must be added. The most suitable dusting powder is lycopodium or calcined magnesia. The following formulas may serve to explain the method:

1. Acidi arsenicosi, 0.10; sebi ovilis, 10.00; pulv. liquiritiae, q. s. f. pil., No. 100. Consp. c. lycopodio.

2. Podophyllini, 0.20; sebi ovilis, 1.00; magnesia ustae, q. s. f. pil., No. 10. Consp. c. magnes. ust.

3. Acidi salicylici, 10.0 ; sebi ovilis, 10.0 ; M. f. pil., No. 100. Consp. c. lycopodio.

4. Natrii jodati, 10.0 ; sebi ovilis, 10.0 ; M. f. pil., No. 100. Consp. c. magnes. ust.—Pharm. Ztg., li., No. 93 (1906), 1033 ; from Ther. Monatsh., 1906, No. 11.

Creosote Pills, G. P.—Improved Formula.—J. Schirmer recommends the following formula for creosote pills, which secures with convenience and celerity a beautiful mass, whereas the present G. P. formula is exceedingly troublesome : Creosote, 10.0 ; glycerin, 1.0, and mucilage of acacia, 4.0, are shaken together, and the mixture is incorporated with finely powdered licorice root, 19.0. The resultant mass, which forms in an incredibly short time, is then divided into 200 pills.—Pharm. Ztg., lii, No. 17 (1907), 169.

Plummer's Pill—Modification of Formula.—Sir James Sawyer, calling attention to the frequent insolubility of the compound calomel pills B. P. (Plummer's Pill) in their passage through the human stomach and alimentary canal, suggests the following formula, which produces pills that disintegrate completely in water at 100° F. in ninety minutes : Hydrargyri subchloridi, antimonii sulphurati, aa gr. j ; resinae guaiaci, gr. ij ; syr. glucos. q. s. ut. fiat pilula.—Pharm. Jour., Dec. 8. 1906, 627 : from Lancet, Dec. 1, 1906.

PULVERES.

Powders—Method of Incorporating Oils.—J. T. Davison observes that in all the formulas that have come to his notice, in which oils are to be incorporated with powders, the directions are to add the oils last and sift. This direction, if followed, results in much tedious sifting and flattening out of lumps with a spatula. A better way is to first place the oil or oils in the mortar, then add about an equal bulk of the diluting powder which absorbs the oil, then little by little, more powder, until all is added. The result is a universal dissemination of the oils through the mass with no lumping, and little or no sifting required and a great saving of time in manipulation.—Drugg. Circ., May, 1907, 347.

Pulvis Glycyrrhizæ Compositus, B. P.—Sulphur and Sulphate Content.—The question having arisen as to how much sulphate would be ordinarily contained in the officially (B. P.) prepared compound licorice powder, F. H. Alcock has made, and records the results of experiments from which it may be safely concluded that Pulvis Glycyrrhizæ Compositus does not contain an appreciable amount of sulphur as sulphate, nor much organic sulphur, and that all the sulphate obtained by any process of oxidation of the added sulphur may be rightly ascribed to this alone. Commercial specimens examined by the author were found to be very variable in the quantity of sulphur. 7.1 per cent., 8.1 per cent., 9.25 per cent., and one sample gave varying results, although taken from the same bottle on

different occasions. This was shown to be due to the fact that a good shake of the bottle is necessary to ensure uniformity of composition, and this cannot be too often called attention to in these days of over-zealous inspection.—Pharm. Journ., Nov. 3, 1906, 485.

Seidlitz Powders—Separate Administration of the Acid and Alkaline Powder.—Professor Wilbur I. Scoville writes that he saw many cases of headache at a food fair, the disorder being brought on by over-indulgence in samples of all kinds of edibles. The ordinary headache powder proving non-efficacious, seidlitz powders were administered, the two portions of the powder being dissolved separately in each instance, and the solutions drank one at a time. "If the patients had any objections to the method of administration, they were feeling too miserable to express them," says the Professor, "but in no case was any discomfort manifested from the effervescence, and every case that he was able to follow showed quick relief." He states that a seidlitz powder yields about a pint-and-a-half of carbon dioxide at the body temperature, and it is his opinion that this gas is an effective corrective of stomach disorders.—Drugg. Circ., Feb., 1907, 227.

Effervescent Epsom Salt—A Palatable Mixture.—E. B. Gregory finds the following formula to yield a palatable Epsom Salt mixture, which may possibly be improved by the addition of 1 to 2 fluidrachms of spirit of lemon: Magnesium sulphate, dried, 3 ozs.; sodium bicarbonate, $\frac{1}{2}$ oz.; tartaric acid, $2\frac{1}{2}$ ozs.; saccharin, $2\frac{1}{2}$ grs. Thoroughly triturate the saccharin and sodium bicarbonate, and then add the salt and acid. It is given in spoonful doses.—Bull. Pharm. July 1906, 302.

Headache Powders—Approved Formula.—Dr. A. Herzfeld, calling attention to the prevalent use of acetanilide as the principal ingredient of headache powders, and its deleterious effects suggests formulas for the use of pharmacists who may be called upon to give relief. Headache powders dispensed by the pharmacists must be by all means harmless, so that if the headache be a prodromal symptom of a disease or a manifestation of an already existing serious disturbance of the body, no harm shall be done. These conditions are met by the following formulas:

R	Sodii salicylatis.	
	Acetphenetidini (Phenacetin), U. S. P	āā 0.5 Gm.
	Caffein. citratæ	0.02 Gm.
M.	ft. pulv., No. 1.	
R	Acid. acetylsalicylic (Aspirin)	0.5 Gm.
	Caffein citratæ	0.02 Gm.
M.	ft. pulv., No. 1.	

It is a good practice to give the patient suffering with headache a saline cathartic to take before the headache powder.—(Proceed. N. Y. State Pharm. Assoc., 1906), Merck's Rep., July, 1906, 196.

Headache Powders—Formula.—B. S. Cooban recommends the following formula for headache powders: Acetphenetidin, 4 drachms; citrated caffeine, 1 drachm; sugar of milk 6 drachms. Mix and divide into 10-grain powders.—Bull. Pharm., April, 1907, 164.

Face Powder—Formula.—H. C. Bradford recommends the following formula for a "Face Powder":

Zinc oxide.....	3	lbs.
Precipitated chalk	18	lbs.
Talcum.....	3½	lbs.
Rice flour.....	6	lbs.
Perfume.....	4	ozs.

For flesh-tint color with a little carmine, while brunette is produced by burnt umber. This should be bolted through cloth to get best results.—West. Drugg., Sept., 1906, 514.

Face Powder—Formula.—The "Journ. de Pharm. et de Chim." suggests the following formula for an efficient face powder: Powdered talc, 94.0; sodium perborate, 5.0; essence of violet, 1.0. Mix. If the powder is intended to whiten the skin the quantity of perborate may be increased somewhat.—Pharm. Ztg., li, No. 93 (1906), 1033.

Lice Powder—Effective Formula.—An Iowa druggist finds a mixture composed of 14 ozs. of powdered naphthalene and 2 ozs. of insect powder to be very effective for destroying mites and lice on poultry.—Bull. Pharm., June, 1907, 250.

Useful Powders—Formulas.—Luther Marshall has found the following formulas to furnish popular specialties with his trade:

"FAVORITE" TALCUM POWDER.

Boric acid, in fine powder.....	1	ounce av.
Salicylic acid.....	100	grains.
Talcum, in fine powder.....	7½	pounds.
Powd. orris.....	½	ounce.
Ext. violet.....	½	ounce.

Mix and sift.

INSECT POWDER.

Sulphur.....	4	ounces.
Tobacco dust.....	6	ounces.
Oil of cedar.....	½	ounce.
Crude naphthol.....	1	ounce.
Insect powder.....	4	ounces.
Powd. chalk.....	q. s.	2 pounds.

The chalk is added to increase the bulk.

POULTRY POWDER.

Ground oyster shell.....	1½ pounds.
Carb. lime	¼ pound.
Phos. lime	¼ pound.
Black pepper (ground)	¼ pound.
Capsicum (ground)	½ pound.
Venetian red	1 pound.

Mix all in fine powder.—Bull. Pharm., Aug., 1906, 323.

RESINÆ.

Jalap Resin—Identification by Means of the Polariscopes.—P. Guignes regards the ether solubility of jalap resin, generally accepted as criterion of identity, as being insufficient, and particularly so in cases of adulteration with such resins as colophonium, mastic, guaiac, sandarac, etc. In such cases, reliable identification is obtainable only by the polarimetric method, which is carried out as follows: The resin having been extracted with alcohol in the usual manner, the residue of distillation, while still semi-liquid, is well washed with water. A quantity of this, corresponding to about 5.0 Gm. of dry substance, is then dissolved in 100 Cc. of alcohol, and the solution is decolorized with animal charcoal. Of this solution 10 Cc. are evaporated to constant weight, to determine the amount of resin, and 20 Cc. of the filtrate are used for the polarimetric determination.—Pharm. Ztg. lii (1907), No. 5, 48; from Bull. des Science Pharm., Nov., 1906.

Podophyllin—Distinction of the "Emodi" from the "Peltatum" Resinoid by the Ammonia Test.—D. B. Dott takes exception to the statement of Henry that the resinoid from *Podophyllum emodi* dissolves in solution of ammonia *similarly* to that obtained from *Podophyllum peltatum*. While it is true that complete solution may be effected in either case when a sufficient quantity of highly diluted ammonia is used, the behavior of the respective resinoids is quite different when they are treated with liquor ammoniæ direct. The "peltatum" resinoid mostly dissolves, while the "emodi" product becomes almost gelatinous in appearance. This deportment may be used for distinguishing the two resinoids, as follows: 0.5 Gm. is treated with 30 Cc. of a mixture of equal volumes of liquor ammoniæ and water, stirring, and bringing well into contact for five minutes then filtering the liquid through a counterpoised filter, washing with water till washings pass practically colorless, drying and weighing. The "emodi" resinoid remains practically undissolved on the filter, while the residue from "peltatum" resinoid should not exceed more than 15 per cent. of its original weight.—Pharm. Journ., Oct. 20, 1906, 431.

Resin of Scammony—Identification.—P. Guignès observes that the test usually applied to the resin of scammony or to scammony gum-resin is that of its solubility in ether. This, however, is said to be of little value.

Varieties of scammony root occur containing resins not completely soluble in ether, and it is practically impossible to distinguish the roots containing resin completely soluble in ether from those containing resin incompletely soluble in that menstruum. The commercial drug is apparently obtained from more than one species of *Convolvulus*, *C. scammonia*, Linn, and *C. stenophyllus*, Boiss., being the probable sources. It is possible with such resins as are incompletely soluble to obtain a clear solution with a little ether, but this becomes cloudy on further dilution. The author suggests the aid of optical determinations to ascertain the source of the resin and its possible adulterants. The best method is to weigh 3-4 Gm. of the finely-powdered resin into a small flask with a short, wide neck, pour on 30 to 40 Cc. of ether and macerate for about six hours; the ethereal solution is filtered through a small, dry filter, and insoluble residue and filtrate weighed. The percentage should be calculated on the dried resin. A resin extracted by the author himself from a specimen of scammony root gave a resin with no less than 71 per cent. insoluble in ether. The optical rotation is between -18° and -25° , and such resins as possess a rotation between $-23^{\circ} 30'$ and -25° have probably been obtained from Mexican male jalap (*I. orizabensis*). The adulterants usually employed are colophony and possibly pitch, flour, sand and licorice. The rotation of colophony is $+6^{\circ}$ to $+7^{\circ}$, of sandarac $+31^{\circ}$ to $+34^{\circ}$, of mastich $+21^{\circ}$ to $+29^{\circ}$, and of guaicum -17° .—Pharm. Jour., March 30, 1907, 401; from Bull. des Sci. Pharm., 13, 433.

SAPONES.

Soap—Determination of Total and Free Alkalies.—P. Grélot recommends the following convenient and accurate method for determining the total and free alkali in soap:

Total Alkali.—Dissolve 2 Gm. of soap in 100 Cc. of boiling water, add five or six drops of a 1 per cent. aqueous solution of Congo red and titrate with semi-normal hydrochloric acid, maintaining the temperature at about 80° C., so that when the fatty acids are liberated they rise and float on the surface; they do not interfere with the titration, and the end reaction is very sharp.

Free Alkali.—Dissolve 5 Gm. of soap in absolute alcohol, filter, wash with absolute alcohol, dissolve the insoluble carbonate in water and titrate with acid, using phenolphthalein.—Pharm. Journ., Mar. 23, 1907, 361; from Bull. des Sciences Pharm., 14, 72.

Hard Soap, B. P.—Unsatisfactory Commercial Supply.—R. A. Cripps when testing a sample of powdered hard soap, purchased as B. P., found it to consist largely of coco-nut oil soap. Samples were afterwards obtained from leading wholesale firms which, with a single exception, yielded similar unsatisfactory results. Upon inquiry he learned that it is the custom of the makers of both "hard soap" and "Castile soap" to use oils other than

olive oil for their manufacture. The author reports the results of his examination of 15 samples of different soaps, including one sample of animal soap, one sample of zinc oleate and five of soft soap, which must be consulted in the original.—Pharm. Journ, April 27, 1907, 519.

Castile Soap—Value of the Refractive Index of the Fatty Acids in Examination.—W. H. Simmons, referring to Mr. R. A. Cripps' observations concerning the difficulty in obtaining pure olive-oil soap (see Hard Soap, B. P.), calls attention to the useful information to be derived from the determination of the refractive index of the soap. Thoenner gives this index for olive-oil fatty acids at 60° C. as 1.441, but the author has found the figure for pure olive-oil fatty acids to be invariably over 1.444, and as the refractive indices of coconut oil and tallow fatty acids are considerably lower than this, the presence of these adulterants is readily detected. The figures in the following table strikingly illustrate the value of the test in conjunction with other data in discriminating between the genuine and adulterated article. Nos. 1 to 9 represent genuine olive-oil soaps; Nos. 10 to 16 all contain coconut oil, while No. 11 consists also very largely of tallow. No. 15 is a particularly poor soap, made entirely from coconut oil, and heavily "liquored," containing only 36.5 per cent. fatty acids:

No.	Titer °C.	Neutralization Value.	Iodine No.	Refractive Index No. at 60° C.	Halphen's Test for Cotton Seed.
1.....	20.5	202.2	81.2	1.4446	Negative.
2.....	21.7	196.6	79.1	1.4454	"
3.....	22.9	200.3	78.8	1.4444	"
4.....	22.4	204.0	80.3	1.4446	"
5.....	20.6	198.4	78.0	1.4448	"
6.....	19.7	198.2	78.5	1.4445	"
7.....	22.7	198.9	80.1	1.4450	—
8.....	22.0	196.6	79.5	1.4442	Negative.
9.....	22.4	200.2	85.1	1.4445	"
10.....	24.4	228.7	—	1.4394	—
11.....	39.5	211.0	40.7	1.4389	Negative.
12.....	19.8	232.1	47.8	1.4372	"
13.....	20.0	232.9	49.05	1.4371	"
14.....	20.9	227.3	56.7	1.4386	"
15.....	22.6	267.1	10.2	—	—
16.....	19.3	227.1	61.0	1.4402	Negative.

—Chem. and Drugg., June 5, 1907, 869.

Sapo Kalinus—Expeditious Process.—A. Graves states that the preparation of soft soap of satisfactory quality is accomplished rapidly by the following process: 1 kgm. of linseed oil is mixed well with 250 Gm. of soft soap and heated on the steam bath; a mixture of 1350 Gm. of solu-

tion of potassium hydroxide and 100 Gm. of alcohol is then added in small portion at a time, stirring constantly until saponification is complete, followed by hot water sufficient to make 2600 Gm. of finished soap—this quantity corresponding to the total weight of the ingredient employed, less the alcohol. The soap obtained in this way within 30 to 40 minutes has a fine consistence and contains more fatty acids than the quantity required by the G. P. in *sapo kalinus venale*.—Apoth. Ztg., xxi, No. 92 (1906), 990.

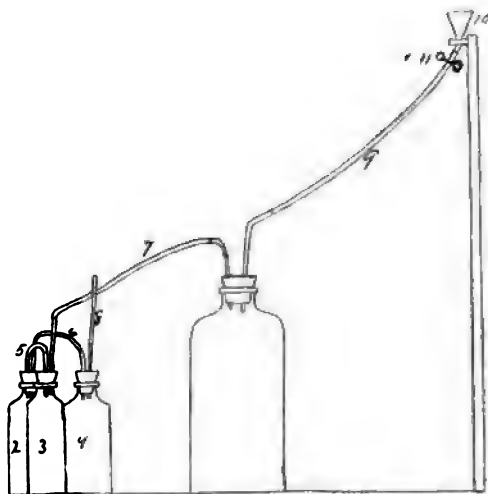
SPIRITUS.

Distilled Spirits—Sources of Error in the Processes of the Swiss and German Pharmacopœias.—E. Beuttner points out that although the distilled spirits, such as spir. cochleariæ, spir. juniperi, spir. lavendulae, etc., are described in identical terms in the Swiss and German Pharmacopœias, the products of the two pharmacopœias cannot be identical since the Swiss Pharmacopœia directs the use of 92.5–94 per cent. alcohol whereas the German Pharmacopœia directs 85.6 to 87.2 per cent. alcohol. But in either case there is likely to be a variation in the alcoholic content and composition of the product of distillation, since under the customary method of distillation the water in the still persistently retains both alcohol and volatile oil in proportions varying according to conditions. The difficulty may, however, be overcome if the end of the distillation be conducted with steam under pressure, which assures the complete vaporization of the volatile components of the material under treatment.—Pharm. Ztg., li, No. 57 (1906), 637.

Spirit of Nitrous Ether—Economical and Convenient Construction of Apparatus for Distillation and Assay.—Willis St. L. Furbush critically reviews the processes heretofore official for the preparation of spirit of nitrous ether. He gives preference to the process of the U. S. P., 1890, which requires distillation, but is quicker and easier than that of 1900, which requires decantation, and recommends the simple apparatus shown by Fig. 30, which may be economically constructed from such material as is usually found in the laboratory. The details of this apparatus are as follows: 1, still; 2, 3, 4, bottles, used for condensing and receiving distillate. These are packed in a freezing mixture; 5 and 6, tubes connecting bottles; 7, tube connecting with condenser; 8, safety tube; 9, rubber tube; 10, funnel; 11, pinch cock. Use for the condenser and receiver a series of three 4-ounce bottles tightly corked and connected by means of glass tubes. Fit the last bottle in the series with a safety tube and pack them in a mixture of salt, ice and water. Connect the first bottle in the series with the still. Use for a still a 1-quart wide-mouthed bottle. Insert a closely fitting cork, through which two glass tubes have been passed. Connect one tube with the condenser and the other with a small glass funnel by means of rubber tubes. A pinch cock is applied to the rubber tube just below the point of the funnel. Mix in the still 127 Gm. of

sodium nitrite, 110 Cc. of alcohol and from 100 to 175 Cc. of water. Now add slowly through the funnel about 200 Cc. of 50 per cent. sulphuric

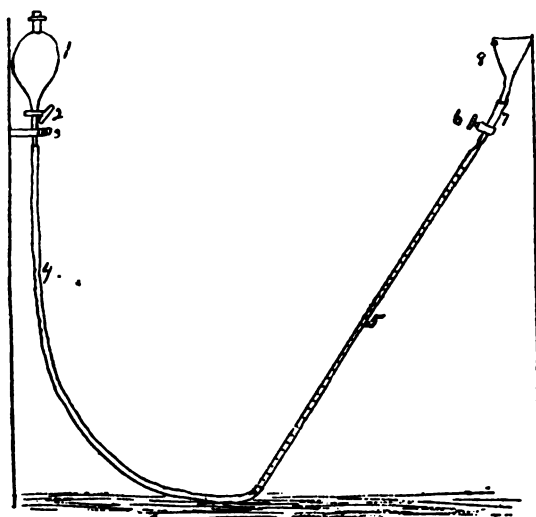
FIG. 30.



Distilling Apparatus.

acid. The flow may be regulated by means of the pinch cock. At ordinary room temperature distillation will begin as soon as the first portion of

FIG. 31.



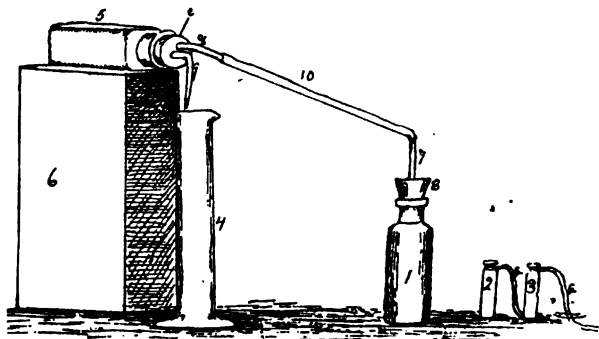
Nitrometer.

the acid is added, and it will usually all distill without more heat. Distilla-

tion may be hastened by setting the still in lukewarm water, or by adding a little hot water through the funnel, but this is not necessary. The distillate, which should yield from 100 to 105 Cc. of ethyl nitrite, is then further treated as directed in the official process.

As few retail pharmacists possess a nitrometer, the author describes two forms, which may, like the distilling apparatus, be conveniently constructed from ordinary laboratory appurtenances. The one shown by Fig. 31 consists of the following parts: 1, separatory flask (an ordinary funnel may be used in its place); 2, stop-cock (unnecessary); 3, support; 4, long rubber tube; 5, burette; 6, stop-cock; 7, short, stiff rubber tube; 8, funnel. It is constructed as follows: By means of a rubber tube connect a small glass funnel with the outlet of a glass-stoppered burette. Connect the other end of the burette with a funnel or separatory flask, using for this purpose a rubber tube about 3 or 4 feet long. The rubber tube connecting the small funnel with the point of the burette should be strong enough to hold the funnel upright. The burette should be of 50 Cc. capacity. As the burette is used upside down, the space between the graduation and the stop-cock should be measured and added to capacity, making about 55 Cc. Moreover, the burette being inverted, the reading is in the opposite direction from that in which it was intended to be used, so the reading must be subtracted from the total capacity to give the correct volume of gas. The funnel connected with the long rubber tube should be of at least 100 Cc. capacity. The method of using this nitrometer is essentially the same as that of the conventional form, while that of using the second nitrometer, shown by Fig. 32, is briefly explained as follows: Into 1 put

FIG. 32.



Nitrometer, second form.

5 Cc. spirit nitrous ether. Into 2 put 5 Cc. of 20-per cent. solution KI. Into 3 put 5 Cc. 25-per cent. H_2SO_4 . By means of strings, *a—**a*, lower 2 and 3 into 1 and insert cork, *b*, tightly. Fill bottle, 5, with water and insert cork, *c*, tightly and place on box, 6, with glass tube, 9, above gradu-

ate, 4. Now shake bottle 1 gently, which will spill contents of 2 and 3 into spirits, causing the gas to pass up through glass tubes 7 and 8 and rubber, 10. The water will flow out through 9 into 4, and the number of Cc. in 4 will indicate the amount of gas produced. This multiplied by 4.55 will give percentage strength of $C_2H_6NO_2$.—Proc. Mass. Pharm. Assoc., 1906, 114-120.

Spirit of Nitrous Ether—Preparation from the Commercial Concentrated Ether.—In reply to a query, Charles E. Vanderkleed states that he has had occasion to examine the 80 per cent. concentrated nitrous ether on the market during a period covering several years and has never found a sample under strength, and that therefore spirit of nitrous ether of official requirement may be obtained from this commercial product provided proper precautions be taken. These precautions consist in chilling the bottle containing the concentrated ether and then to open it with the neck below the surface of about three-fourths the prescribed quantity of alcohol, and allowing it to remain submerged for a few minutes, during which the contents of the bottle will have become so diluted, by diffusion, that the bottle may be removed, and emptied into the rest of the mixture, without loss by evaporation.—Proc. Penna. Pharm. Assoc., 1906, 132.

Spirit of Camphor—Optical Method of Detecting Synthetic Camphor.—G. and R. Fritz suggest that synthetic camphor may be detected in spirit of camphor prepared with it by its optical inactivity, natural camphor, as is well known, deflecting polarized light to the right.—Pharm. Ztg., lii, No. 28 (1907), 291.

Spirits of Peppermint and Spearmint—Modification of Process.—P. H. Utech recommends the preliminary extraction of the herbs—peppermint and spearmint, respectively—with water, by maceration and thorough washing, before adding them to the alcoholic solution of the oils. This insures a deeper and more prominent green color, which might be further improved by doubling the quantity of herbs.—Proc. Penn. Pharm. Assoc., 1906, 80-81.

SUCCI.

Fruit Juices—Organic Acids in Different Kinds.—Jørgensen has determined the acids in different fruit juices with results which in some respects confirm the observations of previous investigators. In the following the quantities refer in each case to 100 Cc. of the fruit juice under examination.

Raspberry Juices contained no tartaric acid and at most only a few milligrams of succinic acid, while malic acid was also present only in small quantities (about 0.1 Gm.). Citric acid, on the other hand, was present to the amount 0.50 and 0.59 Gm. in two samples of sweet juice, and 0.86, 0.99 and 1.04 Gm. respectively in three samples of acidulous juice. As regards the malic acid the author considers it possible that this is not a

natural constituent of the fruit, but was introduced in the samples under examination by the addition of some cherry juice.

Cherry Juices also contained no tartaric acid and only very small quantities of succinic acid. Three samples of sweet juice contained respectively 0.39, 0.40 and 0.43 Gm. of malic acid, and four acidulous juices contained 0.64, 0.69, 0.86 and 0.91 Gm. of this acid.

Elderberry Juice, in one sample, contained 0.59 Gm. of citric acid, while a sample of dried Portuguese elderberries contained 1.15 per cent., citric acid being the only acid present in either. A sample of dried

Huckleberries contained 1.31 per cent. of citric acid and 0.12 per cent. of malic acid.

Inasmuch as tartaric acid is a normal constituent of all grape-wines, and citric acid is never present in ripe grapes, the presence of the latter acid in grape-wine, in appreciable quantity, is doubtless due to a sophistication and would probably indicate the addition of elder or huckleberries.—Pharm. Ztg., lii, No. 29 (1907), 301; from Ztschr. f. Unters. d. Nahrungs-., No. 5, 1907.

Concentrated Fruit Juices and Extracts—Method of Preparation.—Mr. Otto Voly has secured a patent (in Germany) for the preparation of concentrated fruit juices (or syrups) and extracts, which depends upon the extraction of the aroma of the fruit juices by means of volatile solvents (such as chloroform, benzin, benzol, tetrachloride of carbon, ether, carbon bisulphide, amyl acetate, etc.), the concentration of these extractions on the one hand and the concentration of the residual (extracted) juice on the other. The process is exemplified as follows: 500 Kgm. of raspberries are lightly mashed, mixed with 50 Kgm. of 90- or 92-per cent. alcohol, and expressed as convenient. The expressed juice is mixed thoroughly with 35 Kgm. of chloroform, the chloroform extractive is separated after subsidence, subjected to distillation (preferably in a vacuum), and the residue dissolved in strong alcohol. The alcoholic solution is then refrigerated so as to separate plant fats (wax, etc.), filtered cold, and the alcohol then distilled off in a vacuum. The residue consists of 15 to 20 Kgm. of a balsamic mass, which has the pure aroma of the raspberries used in the process. From the residual raspberry juice the chloroform retained by it and all of the alcohol, except that retained in the marc, are now recovered by distillation, and the juice is then concentrated by evaporation. The alcohol retained by the marc may be recovered by distillation and utilized as "Spirit of raspberry."—Pharm. Ztg., li, No. 74 (1906), 819.

Raspberry Juice—Influence of Acidity on its Stability.—R. Krzizan finds that simple sterilization by heating to 80° C. is sufficient to preserve raspberry juice for a period of six months. The subsequent changes are dependent in some degree on the natural composition of the juice, and the author is inclined to the belief that the relative amount of citric acid

present is chiefly concerned in this. He found that the samples which had undergone the greatest change also originally showed the greatest total acidity, which, calculated as citric acid, amounted to as much as 2.55 to 2.89 per cent.—Pharm. Ztg. li, No. 80 (1906), 887.

Strawberry Juice—Preparation.—H. M. Blair gives the following explicit directions for preparing strawberry juice for the soda fountain: Boil 1,000 parts of rain or distilled water and 600 parts of sugar in a large porcelain-lined double boiler, or any suitable vessel of the water-bath type, constantly skimming until no more scum rises to the top. Add five parts of citric acid and continue boiling until you have from 1,200 to 1,300 parts left. Then add your berries, little by little, until five hundred parts of fresh, ripe berries have been added. The berries must previously be stemmed and washed. Throw away all soft or green fruit. The best berries for this purpose are the smaller variety of the deep red berry, as they have the most delicious aroma and flavor. Be careful not to crush the fruit while stirring into the boiling syrup.* When all the berries are stirred into the syrup remove from the fire and cover the vessel closely; place it in a warm spot and let it stand for three or four hours until the mass has cooled down to the temperature of the room; then strain through a felt filter bag, being careful not to crush the berries. Have a quantity of empty champagne bottles (pints are preferable); fill them with warm water; place them in a boiler of hot water and let it come to a boiling point, then empty as rapidly as possible and drain as quickly as you can. Into the hot bottles pour the hot juice, and cork and seal them as fast as you can—and keep hustling until your job is completed. Juice thus prepared retains much of the aroma and flavor of the fresh berries, and if you carefully cork and seal the bottles the juice will retain its properties for a year at least.—Apothecary, May, 1907, 372.

SUPPOSITORIA.

Suppositories—Prevention of Adherence to Mould.—Wm. W. Foster, Jr., after conducting a series of experiments to determine the value of various substances—such as lycopodium, cornstarch, liquid petrolatum, solution of soap, etc.—used for preventing the adherence of cacao-butter suppositories to the moulds during the process of cooling, finds a four per cent. alcoholic solution of castile soap to be the most efficient for the purpose. The solution is thinly spread upon the inner surface of the mould with a piece of absorbent cotton before chilling it, so that the alcohol may evaporate completely before pouring in the melted suppository mass. The author finds, however, that if the moulds are clean, dry and *unscratched*,

* The use of heat is in the opinion of many pharmacists ill-advised, since it injures the delicate flavor of the fruit. See *Strawberry Syrup*, under "Syrup." Rep.

the suppositories may be moulded and removed perfectly without other aid than thorough cooling.—*Amer. Jour. Pharm., Sept., 1906, 417.*

Bougies—Simple Method of Moulding.—A. W. Gerrard describes a simple method for moulding urethral bougies, which requires a few pieces of glass tubing of even bore, a piece of glass rod to act as a piston, and a piece of rubber tubing to act as a suction-tube. The glass tubing should be in about 8 in. lengths, having as near as possible an internal bore equal to the circumference of a No. 9 catheter. The glass piston-rod should be 12 in. in length and of a circumference to pass easily through the tubes. A piece of rubber tube, about 18 in. long, is fitted to one end, by means of which the melted mass, prepared in the usual manner, is drawn into the tube to the required height; the rubber tube is then pinched so as to hold up the fluid mass, and the glass end quickly transferred into chilled water. This process is repeated with other sections of glass tube until a number have been chilled, when the cylinders may be removed by means of the piston-rod and divided into pieces of suitable lengths.—*Trans. Brit. Pharm. Conf. (Yearbook of Pharm.) 1906, 288-289.*

Suppositories—Method of Emulsifying Aqueous Liquids with Theobroma Oil.—In response to a request in the research list of the Brit. Pharm. Conf. for a method of emulsifying aqueous liquids with theobroma oil in the preparation of suppositories, S. Taylor communicates the results of investigations carried out for this purpose. He finds that the addition of 1 to 2 per cent. of sodium stearate to the whole mass emulsifies 30 per cent. or more of water or aqueous liquids, and 30 per cent. of a 45 per cent. spirituous liquid such as liquid extract of witch-hazel. The methods of manipulation vary. In the case of a liquid which may be boiled without injury, the liquid and the sodium stearate may be boiled together first and allowed to cool. The oil of theobroma is then added, and the whole stirred until emulsification takes place. In some cases of difficulty the addition of a small percentage of anhydrous wool fat is of advantage. The following list shows some formulas which have been found to work with satisfaction:

Cacao butter.....	66	64	66	69	48	68	60	72
Sodium stearate.....	4	4	2	1	2	2	2	2
Anhydrous wool fat.....	..	2	2	..	..	..	..	..
Spirit of witchhazel.....	30	30	30	30	30	..	30	..
Oxide of zinc.....	..	..	..	..	12	..	..	..
Hamamelin .....	..	..	..	..	8	..	8	6
Liquid extract of hamamelis .....	..	..	..	..	..	30	..	..
Solution of adrenalin .....	..	..	..	..	..	..	..	20

—*Trans. Brit. Pharm. Conf. (Year-book of Pharmacy) 1906, 262-264.*

Suppositories—Method of Incorporating Extracts.—J. H. Schroeder finds that in making suppositories which contain drug extracts, you can

get the best results by first rubbing the extracts down with glycerin and alcohol, afterwards melting the cacao butter by placing the dish in hot water. By this method the cacao butter does not get hot enough to burn the extracts.—Bull. Pharm., May, 1907, 209.

Glycerinated Gelatin Suppositories.—*Formula*.—Elmer E. Scatchard recommends the following general formula for preparing glycerinated gelatin suppositories, which, with slight modifications, will be found applicable in all cases: Medicinal substance, a sufficient quantity; glycerinated gelatin, 3.5 Gm.; glycerin, 2.5 Gm.; water, 1 Gm. Dissolve the medicinal substance in the water in a warmed mortar, or, if insoluble triturate it thoroughly; add the glycerin and then the melted glycerinated gelatin. Mix thoroughly, and pour into suitable moulds.—Amer. Journ. Pharm., Sept., 1906, 420.

SYRUP.

N. F. Syrups.—*Suggestions*.—Professor Wilbur L. Scoville makes some interesting observations concerning the following N. F. syrups:

Syrup of Coffee.—Much depends upon keeping the vessel well covered during the boiling and cooling. There should be only enough vent to partially relieve the pressure. If a high-grade coffee is used, the addition of 12 Gm. of chicory will improve it, notwithstanding the prejudice against chicory in coffee. For the cheaper coffees, a trace of coumarin will be an improvement. Only a trace should be used, varying somewhat with the grade of the coffee. When properly adjusted the coumarin reinforces the coffee flavor, without itself being noticeable. It should be borne in mind that this preparation is not intended for a beverage, but is used as a flavor in emulsions, etc., and a too delicate flavor is not desirable; it must have enough of the coarser qualities to make it effective as a disguise for unpleasant tastes.

Syrup of Licorice.—A better-flavored preparation can be made by percolating ground licorice root with a weak (0.1 per cent.) solution of ammonium carbonate, evaporating to 450 Cc. and dissolving 850 Gm. of sugar in the liquid. This also makes a lighter-colored preparation.

Syrup of Quinidine.—If the mucilage of acacia is at all acid, the bitterness will be developed. The amount of saccharin solution directed is also too large, in my judgment. It can better be omitted altogether, with satisfaction to the taste.—Drugg. Circ., April, 1907, 295.

Syrupus Althaeæ, G. P..—*Improved Manipulation*.—According to the official (G. P.) directions an infusion of althaea root is prepared by allowing the root and water to stand three hours without stirring, straining off the clear infusion and dissolving the sugar in it. It has been found, however, that even when the infusion or syrup appears perfectly clear they still retain fine particles of root in suspension, and this is considered one of the

principal causes of the instability of this syrup. At a recent social meeting of apothecaries, at Bietigheim, it was suggested that a perfectly bright and stable syrup is obtained if the althaea root is placed upon a filter in a funnel and the necessary quantity of water poured on, returning the filtrate from time to time during two hours. In this way as much substance is dissolved in two hours as is dissolved from the same quantity of root in three hours by the pharmacopœial process, and an absolutely bright infusion is obtained, which secures a syrup free from suspended particles and consequently greater stability.—Pharm. Ztg., li, No. 89 (1906), 985.

Syrup of Guarana—Preparation.—Devaux recommends for the preparation of syrup of guarana to digest the prescribed quantity of the powdered drug with water at 50°–60° C. for 4 to 5 hours, then filtering the infusion and dissolving the necessary quantity of sugar in it. The temperature mentioned must not be exceeded, otherwise filtration will be impeded owing to the swelling of the starch of the guarana paste.—Pharm. Ztg., li, No. 67 (1906), 748; from Journ. de Pharm., 1906, No. 14.

Syrups of Hypophosphites—Three Types of Formula.—W. C. Goode communicates three formulas for different types of hypophosphite syrups—one acid, the other colorless, the third neutral—which, he states, are based upon many years of practical experimentation. The most notable feature in connection with these formulas is the strength, which is far less than that of the preparations commonly in use, and officially recommended, with the single exception of the strychnine content, which is greater. The formulas are as follows:

ACID SYRUP.

Potassium hypophosphite	24 grains.
Manganese hypophosphite	16 grains.
Calcium hypophosphite.....	16 grains.
Iron hypophosphite	20 grains.
Quinine hypophosphite.....	8 grains.
Strychnine hypophosphite.....	2 grains.
Potassium citrate	30 grains.
Hypophosphorous acid	2 drachms.
Water,	
Syrup, of each, enough to make	16 fluidounces.

Dissolve the iron and manganese salts in two ounces of water with the potassium citrate by the aid of heat, and to this add the potassium hypophosphite. Dissolve the calcium hypophosphite in four drachms of boiling water and protect with four ounces of syrup. Dissolve the quinine and strychnine salts with the hypophosphorous acid and a few drachms of water. Mix and add syrup to make the required measure.

COLORLESS SYRUP.

Potassium hypophosphite	24 grains.
Sodium hypophosphite	20 grains.
Manganese hypophosphite	16 grains.
Calcium hypophosphite	16 grains.
Iron hypophosphite	20 grains.
Quinine hypophosphite	8 grains.
Strychnine hypophosphite.....	2 grains.
Phosphoric acid, conc	1 drachm.
Hypophosphorous acid	2 drachms.
Water,	
Syrup, of each, enough to make	16 fluidounces.

Mix the iron hypophosphite and concentrated phosphoric acid, and heat slightly until dissolved. Then add four drachms of water and the manganese and heat till dissolved. For the other ingredients, proceed as in the previous formula.

A NEUTRAL SYRUP.

Potassium hypophosphite	64 grains.
Calcium hypophosphite.....	64 grains.
Sodium hypophosphite	16 grains.
Iron hypophosphite.	32 grains.
Manganese hypophosphite.	16 grains.
Strychnine sulphate.	2 grains.
Quinine (alkaloid).....	4 grains.
Potassium citrate.	1 drachm.
Alcohol.	2 drachms.
Water,	
Syrup, of each enough to make,	16 fluidounces.

Dissolve the calcium, potassium and sodium hypophosphites in boiling water. Dissolve the iron and manganese salts by heating with some water and with the potassium citrate. Dissolve the strychnine sulphate in either of these solutions, the quinine in the two drachms of alcohol, and mix each solution with portions of syrup before combining.—Bull. Pharm., March, 1907, 102-104.

Syrupus Hypophosphitum Compositus, B. P. C.—Improved Formula.—Frank Goldby and Horace Finnemore, in connection with their improved formula for "Liquor Ferri Hypophosphitis Fortis, B. P. C." (which see under "Liquores"), direct attention to the following formula for compound syrup of hypophosphites originated by the late Mr. Harold Wilson :

I.

Strychnine	1 grain.
Hypophosphorous acid	1 fluidrachm.

Dissolve.

2.

Iron ammonium citrate.....	40 grains.
Citric acid	60 grains.
Strong solution of ammonia	1 fluidrachm.
Hypophosphorous acid	200 minims.
Distilled water.....	6 fluidrachms.

Dissolve. Warm gently till red color disappears, then set aside.

3.

Calcium hypophosphite	80 grains.
Manganese hypophosphite.....	40 grains.
Quinine hypophosphite	2 grains.
Sodium hypophosphite.....	40 grains.
Distilled water.....	8 fluidounces.

Dissolve, add the strychnine solution, then the iron solution, and filter. Dissolve 1 lb. of sugar in the filtrate without heat and make up to 1 pint (Imperial) with water.—Pharm. Journ., Febr. 2, 1907, 102.

Syrups of Fresh Lemon or Orange Peel—Improved Process of Preparation.—Manseau recommends the following process for preparing syrups of fresh lemon or orange peel, which keep well, and have an infinitely superior flavor to the syrups obtained by the official (Codex) method:

Loaf sugar in large lumps, 1,700 Gm.; distilled water, 1000 Gm.; citric acid, 30 Gm.; one lemon or orange. The sugar should be broken into large lumps, about 4 or 5 to the kilo. A lemon or orange with a good peel is selected, and this is rubbed on the lumps of sugar until the white portion becomes evident. Meanwhile, the citric acid is dissolved in the water; the sugar is broken up small and added to the acid liquid, which is then heated to boiling and strained, or it may be dissolved in the cold.—Pharm. Journ., Oct. 27, 1906, 461; from Bull. Soc. Pharm. de Bordeaux, 1906, 46, 200.

Strawberry Syrup—Preparation Without Heat.—In reply to a query, "H" communicates the following method for preparing strawberry syrup: In order to retain the full aroma, this syrup can only be made by the cold method, and without addition of any other substance than pure sugar. A large glass funnel, into the neck of which a plug of cotton is placed, is filled with alternate layers, about 4 Cm. high, of freshly gathered wild strawberries (preferably) and powdered sugar, and the syrup, which gradually forms, is collected in small clean and dry bottles, which when completely filled are immediately corked and sealed. So prepared it keeps well for a long time, retaining its aroma perfectly.—Pharm. Ztg., lii, No. 44, (1907), 459.

Wild Cherry Phosphate Syrup—Formula for the Soda Fountain.—J. C. Arthur St. James recommends the following formula for a soda water syrup flavor which finds favor when dispensed under the name of "wild cherry phosphate":

Oil of bitter almonds, synthetic.....	1 fluidrachm.
Alcohol	3 fluidrachms.
Glycerin	6 fluidounces.
Phosphoric acid (85 per cent.)	1 fluidounce.
Sugar color.....	1 fluidounce.
Tincture of cudbear.....	1 fluidounce.
Brandy	3 fluidounces.
Port wine	4 fluidounces.
Tincture of vanilla.....	2 fluidounces.

Mix and add two ounces to a quart of syrup.—Bull. Pharm., June, 1907, 249.

TINCTURÆ.

Tinctures—Influence of Air and Light.—J. Herzog has studied the influence of air and light on alcoholic tinctures under varying conditions, by exposing them to the prolonged action of oxygen (90 per cent.) or atmospheric air, partly in direct sunlight and partly in the dark. His results indicate that alcoholic solutions of vegetable extracts (tinctures and fluidextracts) undergo considerable change when exposed to the action of oxygen, extending even to the partial formation of CO_2 , and that the oxidation is materially enhanced by the exposure to light and heat. On the other hand, atmospheric air, under the same conditions has no effect upon alcoholic solutions or tinctures within a limited period, of about four weeks, and even after such exposure for an entire year the tinctures experimented upon gave no evidence of change that can be regarded as of importance. The author furthermore finds that for the preparation of tinctures

Percolation is Superior to Maceration.—Tinctures prepared by percolation contain more extractive substances than such prepared by maceration, and, although they form larger deposits, these deposits contain a comparatively smaller amount of active substances. He advises, however, that the quantity of tincture prepared should not exceed the supply required for one year.—Pharm. Ztg., li, No. 98, 1906, 1085; from Ber. d. D. Pharm. Ger., 1906, No. 8.

Potent Tinctures—Preparation from Fluidextracts.—Isaac M. Weills advocates the preparation of tinctures of potent drugs, such as aconite, strophanthus, etc., from the standardized fluidextracts. It is well known that drugs vary in their strength, and tinctures prepared from them, unless their content of active constituent is based on actual assay, are therefore quite as liable to become excessive as deficient in strength. By simple dilution of the assayed fluidextract, when such are available, the trouble and expense incident to the assay of the tincture is avoided.—Proc. Penna. Pharm. Assoc., 1906, 79–80.

Tinctures of the G. P.—Determination of Specific Gravity, Extract and Ash.—B. Rapp has made a series of experiments to ascertain the practical

value of ash, extract and specific gravity determinations in the examination of various official (G. P.) tinctures, and reports the following average figures obtained with the tincture indicated :

Tincture.	Sp. Gr. at 15° C.	Dry Substance at 105° C.	Ash.
Tinct. chinæ.....	0.912	5.12 per cent.	0.08
Tinct. digitalis	0.9066	3.27 per cent.	0.17
Tinct. myrrhæ	0.883	4.76 per cent.	—
Tinct. opii spl.....	0.976	5.19 per cent.	0.17
Tinct. valerian. æth.....	0.814	1.36 per cent.	—

The specific gravities of the tinctures correspond well with the average figures ; the percentages of extract and of ash, however, showed considerable variations from the averages.—Apoth. Ztg., xxi, No. 80 (1906), 857.

Tinctura Cinnamomi, B. P.—*Proposed Standards.*—F. H. Alcock observes that the standards adopted (proposed? Rep.) for tinctura cinnamomi, B. P., are the amount of total solids, specific gravity and percentage of alcohol. With regard to the total solids there appears, however, to be much difference of opinion, various competent authorities, such as John Barclay, Moor and Priest, Gadd Brothers and J. C. Umney, having found averages which vary from 2.05 to 2.5 per cent. Three different samples of tincture recently prepared by the author, to which no possible objection could be made on the score of taste, odor and such like tests, yielded respectively 1.6, 1.9 and 2.1 per cent. of total solids. He concludes that the essential ingredient is perhaps not dealt with at all when only the three data named alone are determined, and that other data for confirmation of genuineness of a sample should be looked to before pronouncing judgment.—Pharm. Journ., June 8, 1907, 746.

Tinctures of Digitalis, Strophanthus and Apocynum—*Effect of Treatment with Ferric Hydroxide and Chilling.*—Prof. R. R. D. Cline describes a method which he has successfully applied to the preparation of active, stable, and practically colorless, odorless, and tasteless tinctures from digitalis leaves, strophanthus seeds, and the roots of *Apocynum cannabinum*. The method as applied to digitalis leaves, for instance, consists in extracting the finest leaves obtainable with petroleum-benzin, and then preparing from the exhausted leaves the tincture in the usual manner. He then adds recently prepared ferric hydroxide in the proportion of about 8 ozs. to the pint of tinctures, agitating the mixture frequently during three days, and after sprinkling the tinctures with talcum, subjects it

to filtration. The filtrate is now chilled on ice and kept at a freezing temperature for about six hours, when it is again filtered. By this process he claims to remove the fats, tannins, gums, proteids, extractive matters, etc., as well as other objectionable constituents contained in the several drugs mentioned.—Merck's Rep., Sept., 1906, 261.

Tincture of Guaiac.—Causes that determine the blue color in the test for *Blood*, which see under "Organic Chemistry."

Tincture of Iodine—Influence of Light and Air.—The tincture of iodine of the U. S. P. is prepared by dissolving 1 part of iodine in 10 parts of alcohol and therefore contains when freshly made 9.09 per cent. of iodine. The Pharmacopœia, however, makes an allowance for 5 per cent. loss, mainly due to the formation of compounds on keeping, and therefore requires a minimum content of only 8.56 to 8.58 per cent. of free iodine. Experiments made by C. Hugenholtz now prove that this allowance is by no means excessive; in fact it may prove insufficient if, as would ordinarily be considered proper, the tincture is preserved in completely filled bottles and protected from light. Under these conditions the free iodine continues to enter into combination, so that, in an actual experiment, the loss of free iodine amounted to 16.5 per cent. in the course of six months, whereas the same tincture kept in partly filled bottles and freely exposed to light gave a titration with thiosulphate figures corresponding to a loss of a little over 5 per cent. of free iodine. This difference is due to the fact that by the influence of light and air the combined iodine is again set free almost at the same rate as it enters into combination. Tinctures of iodine should therefore be preserved in partly filled bottles and preserved with access of light.—Pharm. Ztg., lii (1907) No. 22, 222; from Pharm. Week Bl., 1907, No. 9.

Tincture of Iodine—Convenient Method of Preparation.—P. H. Utech finds it convenient to effect the solution of the iodine and potassium iodide in the alcohol by enclosing the solids in a muslin bag and suspending in $\frac{1}{10}$ of the solvent, so that it is just immersed beneath the surface. By circulatory displacement solution is thus effected within about an hour, without requiring any further attention than the removal of the empty bag, washing it with remaining solvent, and adjustment to the required volume.—Proc. Penna. Pharm. Assoc., 1906, 81.

Tincture of Iodine—Manipulation.—Leo Eliel observes that the direction in the U. S. P., VIII, formula for tincture of iodine to triturate the iodine and potassium iodide in a mortar, is both wasteful and liable to be inconveniently irritating to many. Better results and no waste may be had by resorting to any one of the many methods applied for solution by circulatory displacement.—Proc. Indiana Pharm. Assoc., 1906, 70.

Tincture of Lactucarium, U. S. P.—Do not Economize on Sand.—Leo Eliel finds it desirable to use plenty of sand if it is desired to complete the

preparation of tincture of lactucarium in a reasonable length of time. The bulk of the sand should be four to six times that of the lactucarium.—Proc. Indiana Pharm. Assoc., 1906, 70.

Tincture of Musk, U. S. P.—A Useful Process.—Leo Eliel states that it is impossible to exhaust the musk in the manner directed in the U. S. P. and obtain a 5 per cent. tincture. He suggests that the tincture be obtained by simple trituration *and not filtered*, and to direct that it be dispensed with a "shake" label.—Proc. Indiana Pharm. Assoc., 1906, 69.

Tinctura Oleæ Foliorum—Preparation and Therapeutic Value.—Referring to the fact that the late Daniel Hanbury had as early as 1854, writing at the time of the Crimean War, called attention to the value of olive leaves as a substitute for the costly quinine in the treatment of the numerous cases of fever presenting themselves in the military hospitals. Dr. Sir James Sawyer directed his druggists to prepare a tincture of these leaves, similar in strength and mode of preparation to tincture of buchu, B. P.—namely, 4 ozs. of the leaves exhausted with sufficient 60 per cent. alcohol to make one pint. The brownish, olive-green tincture obtained had a faintly aromatic odor, and a pleasant, hop-like, bitter and faintly sweetish taste. With water it makes an opalescent mixture with slight dichroism between greenish and brownish tints. It contains sufficient tannin to produce inky mixtures with ferric salts, and to precipitate alkaloids from their solutions. It may be given as a tonic in doses of 15 to 30 minims, and as a febrifuge and antiperiodic in larger doses, but the author fails to communicate the results of clinical observations, other than those recorded by Hanbury.

Alcoholic Extract of Fresh (Green) Olive Leaves was also prepared. It had a sea-green color, and may be given as a tonic in doses of 5 grains or more.—Pharm. Journ., Oct. 6, 1906, 376.

Tincture of Vanilla—Preparation from Bourbon Bean.—William Major prepares tincture of vanilla from Bourbon vanilla beans by the following modification of the U. S. P. process: Macerate the beans in boiling water for one-half hour, then add a sufficient quantity of dilute alcohol. The boiling water destroys the bitter taste characteristic of the Bourbon beans, and the tincture then produced compares well with a tincture made from the Mexican vanilla.—Bull. Pharm., June, 1907, 249.

Warburg's Tincture—Manipulation.—P. H. Utech states that if in the directions of the N. F. for preparing Warburg's Tincture the word "digest" be changed to "macerate" and the time extended to about 48 hours, a more satisfactory filtrate will result, while the substitution of "quinine bisulphate" for the "ordinary sulphate," insures a finished product that is free from precipitate.—Proc. Penna. Pharm. Assoc., 1906, 81.

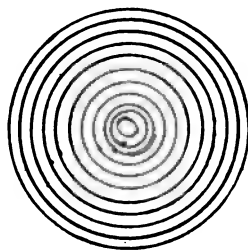
UNGUENTA.

Ointments—Hints for the Dispenser.—E. J. Emelin gives some useful hints concerning the dispensing of ointments. To fill an occasional collapsible tube with a salve, roll the salve in a piece of waxed paper, place one end of this roll into the tube opening and squeeze the ointment into the tube until it begins to issue from the small opening, then screw on the caps and seal the tubes in the usual way. The same method applies to the filling of soft, elastic capsules with ointment. A neat way of finishing the ointment surface in the jar about to be dispensed is made by the use of a piece of tin (or cardboard) cut as shown by Fig. 33. To use, place one of the dentations on the edge of the filled jar and rotate slowly until a

FIG. 33.



FIG. 34.



complete circle is formed. The surface will then have the appearance indicated by Fig. 34, but the dentation can be varied to suit the fancy.—Apothecary, March, 1907, 186.

Paranols—New Ointment Bases.—John Humphrey recommends a new class of ointment bases which he designates as “paranols,” having been suggested to him by the observation of A. Kopp that soft and liquid paraffin can be formed into stable emulsions with water by the addition of a small quantity of wool fat, beeswax, spermaceti, or other substances, consisting chiefly of the higher alcohols or esters of those alcohols. The resulting emulsions are absorbed readily through the skin, cause no irritation, do not become rancid, and serve well as vehicles for various medicaments. The following formulas yield satisfactory products, that made with wool fat being somewhat better than the second and third :

Wool-Fat Parenol: Soft paraffin, 65 parts ; wool fat 15 parts ; distilled water, to produce 100 parts.

Beeswax Parenol: Soft paraffin, 70 parts ; white beeswax, 5 parts ; distilled water, to produce 100 parts.

Spermaceti Parenol: Soft paraffin, 70 parts ; spermaceti, 5 parts ; distilled water, to produce 100 parts.

Liquid Parenol: Liquid paraffin, 70 parts ; white beeswax, 5 parts ; distilled water, to produce 100 parts.

The admixture is effected in a warm mortar by adding the warmed water to the previously melted ingredients. The solid parenols are of ointment-like consistence, can be made to take up more than their own weight of water, and mix well with all fats. The liquid parenol serves well as a neutral liniment and has similar properties to the solid.

Parenol Cold Cream is efficiently made according to the following formula: Soft paraffin, white, 12 parts; white beeswax, 12 parts; almond oil (by measure), 50 parts; borax, 1 part; rose water, 25 parts; oil of rose, a sufficient quantity.—Pharm. Journ., Dec. 8, 1906, 623.

Parenol Ointment Bases—Practical Observations.—A. McMillan records some practical, although limited, observations concerning the value of the parenol ointment bases. Of the three ointment-like bases described in the preceding abstract, he finds that containing spermaceti the only unsatisfactory one. Satisfactory ointments of conium and of gall and opium were obtained with the parenol containing wool fat, and equally satisfactory phenol ointment with the base containing 5 per cent. of white wax. The formula for parenol cold cream also proved quite reliable.—Pharm. Journ., Jan. 5, 1907, 5.

Adeps Benzoatus—Improvement of Formula.—D. B. Dott, after a critical comparison of the formulas of the British, U. S., German and French Pharmacopœias for preparing benzoated lard, regards them all, as being open to more or less objection, and particularly that of the B. P., which, directing the use of 3 per cent. of benzoin, appears to him a clumsy and wasteful method for obtaining an antiseptic product. In his opinion, a combination of the German process, which directs the use of 1 per cent. of benzoic acid alone, with the addition of a simple and direct method of imparting a suitable odor, possibly also the addition of a little wax, as in the U. S. P. process, would be a desirable improvement. He has found 60 grains of benzoic acid and 40 grains of prepared storax, to give a good result, without the necessity of straining the melted product.—Pharm. Journ., Oct. 20, 1906, 431.

Unguentum Simplex, G. P.—An Ideal Substitute.—Over the signature of "K. — Lüdenschied i. W.," the simple ointment of the G. P. is criticised unfavorably and a mixture of 1 part of anhydrous wool fat and 2 parts of yellow American vaseline prepared on the steam bath, recommended as being, an ideal substitute. It is emollient, homogenous, odorless, stable, and capable of taking up 100 per cent. of water.—Pharm. Ztg., lii (1907) No. 18, 179.

Ointments—Improved Formulas.—E. Cruse finds that a number of official (G. P.) ointments, which are intended as protectives rather than for their systemic effect, are more satisfactory when the animal or vegetable fat prescribed is substituted wholly or in part by vaseline or paraffin ointment, and recommends the following improved formulas:

Unguentum Diachylon.—Empl. lithargyri, 50.0 ; vaselin. alb., 50.0 ; acid. benzoic, 0.5 ; aqua destill., 5.0 ; ol. lavandul., gtt. ii. The water is added lukewarm to the previously melted and half-cooled mixture of lead plaster and vaseline, and the oil is added last or, if desired, may be omitted. After standing some time (best for one day) the ointment should be thoroughly stirred again, as required by the G. P. A good ointment is also obtained if 10.0 of the vaseline is substituted by the same quantity of adeps lanae hydrosus. It is of course necessary that the lead plaster shall be of unobjectionable quality.

Unguentum Zinci, G. P., made with lard as officially required, soon becomes rancid, hence physicians frequently direct that it be prepared freshly. If, however, a mixture of hydrous wool-fat and paraffin ointment is used in place of lard a permanently stable ointment is obtained. The difficulty of obtaining a smooth ointment is overcome by triturating the zinc oxide with an equal weight of glycerin, after first thoroughly triturating the oxide thoroughly by itself. The improved formula is as follows: Zinc oxide, 10.0 ; glycerin, 10.0 ; lanolin, 10.0 ; paraffin ointment (G. P.), 70.0. The addition of 20 drops of tincture of benzoin covers the not particularly agreeable odor of the lanolin-paraffin base. Finally, the author suggests a stable substitute for

Unguentum Leniens, which may be prepared without heat according to the following formula: White vaseline, 26.0 ; paraffin ointment (G. P.), 14.0 ; hydrous wool-fat, 10.0 ; distilled water, 20.0 ; glycerin, 30.0 ; oil of geranium, 2 drops. The water is added in divided portions to the previously prepared mixture of vaseline, paraffin ointment and wool-fat ; the glycerin and perfume are added last.—Pharm. Ztg., li, No. 82 (1906), 906-907.

Cold Cream—Manipulations.—E. G. Beard suggests that distilled water be used instead of rose water, using the other ingredients prescribed by the U. S. P. for making cold cream, and recommends the following manipulation: The wax and the spermaceti should be broken into pieces and dissolved in the almond oil with a gentle heat ; a hot water-bath should be used. The borax and water should be heated to the boiling-point, and this hot solution should be stirred slowly into the oil while it is also hot. A white cream results, which must be beaten in the usual way, and when nearly cold otto of rose should be added to perfume. No water separates from this cold cream if these directions are followed, even on long standing. To put up in jars add ten drops of formaldehyde to the pound.—Proc. Mississippi Pharm. Assoc., 1906, 41.

Mineral Cold Cream—Formula.—H. C. Bradford gives the following formula and directions for preparing a "Mineral Cold Cream:"

Liquid petrolatum.....	6 ozs.
White wax.....	2 ozs.
Water.....	2 ozs.
Borax.....	30 grs.

Melt the wax, add the oil, and continue heating. Dissolve the borax in the water, and heat to boiling, then pour slowly into the hot-oil mixture, stirring briskly. Continue stirring until nearly cold, when add the perfume. Rose is the nicest perfume for cold cream. To insure success, both water and oil must be boiling hot when mixed.—*Western Drugg.*, Sept., 1906, 514.

Unguentum Leniens, G. P.—Manipulation.—Joh. Loos observes that when the cold cream of the G. P. is made with observance of the following manipulation, it will keep well for months in a satisfactory condition: The prescribed quantities of white wax and spermaceti are melted with one-half the prescribed quantity of almond oil, and strained through gauze, covered with a thin layer of loose cotton; the other half of the oil is now added, if necessary, again strained, and the whole stirred with a warm pestle. If turbidity ensues, caused by separation of wax, a gentle heat is applied to clarify, and then the prescribed quantity of water, previously warmed, is added *in one portion*, and the clear mixture stirred continuously until cool. The ointment is then allowed to stand in the cellar over night, and, after again thoroughly stirring, the required quantity of oil of rose is added. The *crux* of this manipulation appears to be the right temperature at which to begin the stirring.—*Pharm. Ztg.*, li, No. 76 (1906), 843.

Carbolic Acid Ointment, B. P.—Improved Formula.—Objection having been raised to the present B. P. formula for carbolic acid ointment on account of its strength, its consistence and the separation of globules that takes place when the ointment is kept, James Hamerton, leaving out the question of strength, which falls properly within the province of the medical profession, suggests the following formula as an improvement of the present official one:

	Parts by weight.
Phenol	4
Camphor	2
Hard paraffin.....	8
Soft paraffin.....	86
	<hr/>
	100

Liquefy the camphor and phenol with gentle warmth, add to the melted paraffins, stir till about to solidify, and allow to set.—*Pharm. Journ.*, Jan. 19, 1907, 55.

Unguentum Caseini-Unna—Formula.—Prof. Francis Hemm quotes Dr. Unna's formula for casein ointment as follows: Take milk from which the cream or fat has been entirely removed and curdle it by the addition of rennet at a temperature of 30° to 40° C. Collect the coagulum and wash freely with cold water until the washings are no longer acid. Dry carefully and reduce to powder. Dissolve 34.5 parts of caustic potassa and 8.5 parts of caustic soda in 5000 parts of water and dissolve 1400

parts of casein in this solution. Now add 700 parts of glycerin and 50 parts of carbolic acid, and when dissolved incorporate 2100 parts of vaselin and 50 parts of zinc oxide and finally enough water to make 10,000 parts.

Note.—Acids and acid salts are incompatible with this preparation.—Meyer Bros. Drugg., July, 1906, 192.

Casein Cream—Formula.—Dr. Mary Emma Doyle discusses the subject of the casein or massage cream which have lately attracted considerable attention and for which different formulas have been given. The formula most quoted calls for casein, boric acid and glycerin. Five or six formulas might be given, all dependent upon the manner in which the casein has been precipitated—dilute acids, rennet, alum, magnesium sulphate, etc., being used for this purpose; but the author selects among these the cream most closely approaching that widely advertised article, Pompeian massage cream, which is prepared as follows:

Casein (precipitated by magnesium sulphate and alum)	100 Gm.
Boric Acid	20 Gm.
Cacao Butter	10 Gm.

Solution of Carmine, enough to color.

Extract of Bitter Almond, enough to perfume.

The solution of carmine is first rubbed well with the casein in quantity sufficient to give the desired shade; then add the boric acid. Incorporate the previously melted cacao butter, and finally add the perfume.—Drugg. Circ., June, 1907, 405-406.

Unguentum Cocainæ, P. B.—Improved Formula—R. A. Cripps calls attention to the instability of the cocaine ointment of the B. P., which he attributes to the decomposition of cocaine alkaloid directed in the official formula. His experiments indicate that cocaine hydrochloride possesses satisfactory stability, which he suggests in place of the alkaloid using also hydrous wool fat in place of lard (and oleic acid, Rep.) so as to insure the solution of the salt—the formula recommended being as follows: Cocaine hydrochloride, 4 Gm.; hydrous wool fat, 96 Gm. Reduce the cocaine hydrochloride to fine powder and mix thoroughly with the hydrous wool fat.—Trans Brit. Pharm. Conf. (Yearbook of Pharmacy) 1906, 260-262.

Unguentum Diachylon—Manipulation.—J. Leon Lascoff finds that the best way to prepare ungt. diachylon is to melt the lead plaster and olive oil and strain through cheese cloth into a mortar. Rub well, and add a few drops of water. This will turn out a nice, soft, white color; otherwise it will be of a brownish color and not soft.—Apothecary, March, 1907, 186.

Unguentum Hydrargyri Ammoniati.—Preparation with the Moist Fresh

Precipitate.—H. Vörner recommends that white precipitate ointment be prepared, similarly to the yellow mercuric oxide ointment, by incorporating the fat with freshly prepared ammoniated mercury while in a moist condition. A good ointment is obtained by incorporating the calculated quantity of the mercurial compound, in well drained magma, direct with vaseline.—Pharm. Ztg., lii (1907) No. 22, 222; from D. Med. Wschr. 1907, No. 10.

Mercurial Ointment and Gray Oil—Method of Extinguishing the Mercury.—H. A. B. Dunning finds anhydrous wool fat to be an excellent extinguishing agent for mercury, his attention having been called to it by a formula attached to a prescription for "oleum cinereum" (gray oil). This directed that 8 Gm. of lanolin be rubbed with chloroform to emulsify, and to continue the trituration until the chloroform is evaporated; then to add, while still fluid, 16 Gm. of mercury and triturate until the mercury is extinguished. This having proved a rapid method for extinguishing mercury, the author made a number of experiments which lead him to recommend the following method for preparing "gray oil" extemporaneously, and without the intervention of chloroform:

Mercury	15 Gm.
Anhydrous wool fat	5 Gm.
Olive oil	30 Gm.

Melt the wool fat and pour into a warm mortar; wait until the wool fat has cooled nearly to the congealing point, but is still liquid, add the mercury, and triturate thoroughly for about five minutes, or longer if necessary and then add the olive oil gradually with constant stirring. Obviously, the method, which is easy and rapid, recommends itself for the preparation of mercurial ointment.—Proc. Maryland Pharm. Assoc., 1906, 70.

Gray Oil—Formula Suitable for Hypodermic Injections.—Gray oil (mercurial oil: oleum cinereum) as usually prepared is comparatively hard at ordinary temperatures, and it is necessary to heat it in a water-bath to a temperature of 30° C. before it can be used for hypodermic injections. During this softening process a certain amount of mercury separates and sinks to the bottom, so that unless it is thoroughly shaken every time it is used, the unused portion will retain an increasingly larger percentage of mercury. Queyrat attributes much of the trouble to carelessness in heating, thus exposing the oil to too high a temperature. He therefore prefers an oil which is liquid at ordinary temperatures, and such is obtainable by the following formula, developed by Lafay after much experimentation:

Mercury	40 Gm.
Lanolin (sterilized)	13.5 Gm.
Oleo-naphtine	46.5 Gm.

This forms a homogeneous gray oil, which begins to liquefy at 12° C. and is fluid at 15° C. Queyrat states that this oil is admirably tolerated, and causes no pain when injected. The *oleo-naphthine* required in this formula is stated to be a petroleum oil of a constant density.—*Amer. Drugg.*, March 25, 1907, 171; from *Bull. et Mem. Soc. Med. des Hop. de Paris*, Feb. 14, 1907.

Potassium Iodide Ointment—Method in Valuation.—E. Rupp and J. Kost recommend a convenient method for the determination of potassium iodide in the ointment, which depends on the separation of the iodine from its combination with an acid solution of permanganate, elimination of the latter by means of oxalic acid, and titration of the separated iodine with thiosulphate. The process is conducted as follows: The iodide is extracted from the ointment by washing with water, the aqueous solution is treated consecutively with sulphuric acid, powdered oxalic acid and permanganate in excess, and is then set aside for 2 or 3 hours, with occasional shaking, during which the excess of permanganate or manganese peroxyhydrate is completely reduced. The iodine in the residual solution is then dissolved by the aid of 1 Gm. of potassium iodide, and titrated in the usual manner, with or without the addition of starch paste, with $\frac{N}{10}$ thiosulphate.—*Pharm. Ztg.*, lii (1907), No. 13, 125.

Resorcin Ointment—A Kink in Manipulation.—J. C. Arthur St. James, having tried various expedients to obtain a smooth resorcin ointment by following the directions of the N. F., finally succeeded by the following manipulation: The paraffin, petrolatum and wool fat are melted in the order named, the oil of cade is added, and the warm mixture is then added to the powders in a large mortar and triturated until cool. A perfect mixture, uniform in color, results.—*Bull. Pharm.*, April, 1906, 163.

Compound Resorcin Ointment—New Formula.—E. A. Schellentrager and Otto E. Muhlhan propose the following formula for a compound resorcin ointment which differs essentially from that official in the National Formulary: Melt 5 Gm. of resorcinol in a test-tube and add to it 30 Gm. of previously-melted lanolin. Incorporate 10 Gm. of sulphur and 20 Gm. of zinc oxide with 30 Gm. of vaseline; then add the lanolin-resorcinol mixture and, lastly, 5 Gm. of oil of cade, and mix thoroughly.—*Proc. Ohio State Pharm. Assoc.*, 1906, 47.

Sulphur Ointment—Manipulation.—W. H. Ellis has experienced a great deal of difficulty in getting sulphur ointment perfectly smooth, his method consisting in rubbing the sulphur on a slab with a spatula, as it cannot be triturated in a mortar. He has recently found, however, that if the sulphur is placed upon a small, smooth board and rubbed with a spatula, it can be incorporated with the lard easily, and a very smooth ointment, free from coarse particles, is the result. A piece of common oak board, 10 by

12 inches in size, and sand-papered on one side, is just the thing.—Bull. Pharm., April, 1907, 164.

MISCELLANEOUS FORMULAS.

"Kwass"—A Popular Russian Beverage—Methods of Preparation.—

In view of progressive extension of the anti-alcohol movement throughout the civilized world it is of interest to learn something in regard to a cheap and palatable non-alcoholic, or rather very weak-alcoholic, beverage, the so-called "*kwass*" which has for ages been in popular use in Russia. No Russian household, or hospital, or military barracks, appears to get along without this beverage, which is not only easily prepared from such ingredients as are readily and economically accessible, but furnishes a very acceptable and nutritious drink. R. Kobert has collected a number of formulas for its preparation, which, while differing to some extent in the actual ingredients employed, and in their proportions, do not differ essentially in these respects, nor in the method of their treatment. Originally, probably for use in individual households, it appears to have had the coarse rye-bread of the country as a basis; but this was in the course of time improved upon by the substitution or addition of rye malt, barley malt, rye meal and buckwheat, particularly when large quantities were required, as for example in hospitals and barracks. Two kinds of "*kwass*," are made at the present day from bread, the one known as "*white kwass*," from ordinary rye-bread, the other called "*bread kwass*" from toasted rye-bread. The others, designated as "*hospital kwass*" and "*malt-kwass*," have the above named cereals as a basis. In addition to these ingredients a certain amount of sugar is added, together with more or less peppermint herb to give flavor, and a leaven of wheat flour and yeast to ensure fermentation. The method of preparation, while differing in some unimportant details in these different kinds of "*kwass*," dependent on the ingredients, is sufficiently illustrated in the following:

Malt Kwass.—1.6 kgm. of rye malt, 1.6 kgm. of barley malt, 1.2 kgm. of rye flour, and 400 Gm. of buckwheat meal are placed into an iron kettle with sufficient boiling water to form a thin magma, which is thoroughly stirred. The kettle with contents is then placed in a well-heated Russian oven, in which it is allowed to remain 24 hours, and occasionally stirred. The magma is then poured into a small tub, 16 Gm. of peppermint herb are added, and 40 liters of boiling water is poured on, the tub being covered with a cloth, but the contents occasionally stirred until next morning or so long as the liquid retains a lukewarm temperature. In the morning a leaven is prepared with 200 Gm. of wheat flour, 12 Gm. of compressed yeast, and sufficient water to make the dough, which is allowed to rise, then kneaded and once more allowed to rise. Meanwhile the fluid contents of the kettle are strained through a sieve, the thick residue being rejected, and the strained liquor moderately warmed, is returned to the thor-

oughly rinsed tub ; 2.5 to 3 kgm. of powdered sugar are added, followed by the leaven, and the well-covered tub is allowed to stand in a moderately warm place until a thick froth has formed on the surface. This is removed by skimming, the clear liquid transferred warm to bottles, each containing 2 raisins, securely corked, allowed to cool slowly, and stored on ice. The yield is about 45 bottles (23 liters) of excellent "kwass."—Pharm. Ztg., li, No. 98, (1906), 1084.

Bitters—Flavoring Agents.—In a lecture which Prof. Wilbur L. Scoville delivered before the Manhattan Pharmaceutical Association, he remarked that considerable difficulty was experienced in the flavoring of bitters. The pharmacopœial tincture of gentian is an instance of artistic pharmacy in the line of aromatic bitters, the aromatics in this case being orange peel and cardamon. When the preparation contains strychnine the mixture can scarcely be made anything but bitter. Malt will go well with bitter drugs, but it is often less efficient than brown sugar. With an unpleasant bitter, like myrrh, a little salt will blend remarkably well, but the mixture must not be made too sweet. Moreover, too much salt must not be used. You must use just enough to brighten the mixture up. Aromatics must be used sparingly. It is always a mistake to attempt to cover up one pungency with another. It is better to work with opposites.—Bull. Pharm., July, 1906, 302.

Condiments—Approved Formulas.—H. C. Bradford communicates the following formula for a condiment, in form of powder, which has quite a reputation under the name of the

"German Emperor's Table Zest."—

Dried lemon peel.....	9	ozs.
Cloves	1	oz.
Salt	4	ozs.
Ginger.....	1	oz.
Mustard	2	ozs.
Black pepper'.....	1	oz.
Capsicum	$\frac{1}{2}$	oz.
Celery seed.....	$\frac{1}{2}$	oz.

All should be in powder and well mixed.

This condiment will tone up an ordinary soup or roast to a point that may fairly be called delicious. The author also gives a formula for a

Liquid Condiment, which, however, is more in the line of cakes, sweets, etc., and is as follows

Oil lemon	$1\frac{1}{2}$	drachms.
Oil cinnamon.....	1	drachm.
Oil bitter almond.....	1	drachm.
Oil nutmeg.....	$\frac{1}{2}$	drachm.
Alcohol.....	8	ozs.

The almond oil should be free from hydrocyanic acid. The taste of this condiment can hardly be named ; it has a nutty, appetizing flavor that is most excellent.—West. Drugg., May, 1907, 245.

Corn Remedies—Formulas Recommended by Mr. Ebert.—The following formulas for corn remedies were recommended by the late Albert E. Ebert in his last contribution to Meyer Brothers Druggist (July, 1906, 193) on "Working Formulas" :

CORN CURE.

Salicylic acid	30 grs.
Lactic acid, concentrated	20 grs.
Collodion	1 fl. oz.

Mix.

CORN SALVE.

Salicylic acid	$\frac{1}{2}$ av. oz.
Yellow wax	6 av. ozs.
Resin	$\frac{1}{2}$ av. oz.
Venice turpentine	$\frac{1}{2}$ av. oz.
Petrolatum	1 av. oz.
Peru balsam	$\frac{3}{4}$ av. oz.

Melt the wax and resin, add the petrolatum, turpentine and Peru balsam and lastly the salicylic acid, and stir till cold.

"*Prunella Laxative*"—*Formula.*—A. F. Magoffin communicates the following formula for an active cathartic, which he has marketed with satisfaction under the name of "Prunella Laxative" :

Prunes, choice	2 pounds.
White sugar	5 pounds.
Fluidextract of cascara, aromatic	1 pint.
Aqueous extract of senna	1 pint.
Spirit of lemon	4 ounces.
Saccharin	1 drachm.
Water, enough to make	12 pints.

Boil the prunes in 5 pints of water for fifteen minutes and add the remaining ingredients. Dose, as an active cathartic for an adult, 2 teaspoonfuls, repeated in four hours, if needed ; for a child, in proportion.—Drugg. Circ., May, 1907, 349.

Tooth-Ache Remedy—Formula.—The following formula for an efficient tooth-ache remedy is recommended in "Bull. Commenc." (1966, No. 4): Menthol, 2.0 ; camphor, 1.0 ; cocaine hydrochlor., 0.25–0.5. It is applied on cotton in the cavity of the tooth, renewing the application every half hour until relief. Pharm. Ztg., li, No. 67 (1906), 748.

Toilet Creams—Formulas.—Paul Caldwell recommends the following formulas for preparing toilet creams which have proven more satisfactory than some recent formulas that have come under his notice. He supplies

Cold Cream in two forms, the one for general toilet use, the other for theatrical purposes. The latter is sent out soft and greasy, and so made that a small quantity covers a large space. The formula for the first kind is as follows :

Liquid petrolatum.....	1 gallon.
Soft petrolatum.....	7 ounces.
Hard paraffin.....	7 ounces.
White wax.....	2 pounds.
Borax.....	2 ounces.
Glycerin.....	2 ounces.
Water.....	5 pints.
Perfume.....	enough.

The white wax is first melted in a water-bath (no higher heat must be allowed), then the hard paraffin is introduced, after which the soft and liquid petrolatums are added. The borax is dissolved in water and the solution brought to 140° F. The two liquids are mixed, their container placed in ice water, and the mixture stirred briskly until cold.

Theatrical Cold Cream is made according to the following formula :

Spermaceti.....	1 pound.
White wax.....	3 pounds.
Liquid petrolatum.....	2 gallons.
Borax.....	4 ounces.
Water.....	1 gallon.
Perfume, enough.	

This is a soft cream designed especially to spread easily and quickly, and seems to meet the demand of "the profession."

Almond Cream, that has proven quite satisfactory, is made according to the following formula :

Sweet almonds, best selected.....	5	pounds.
White wax.....	1	pound.
Spermaceti.....	1	pound.
Expressed oil of almond.....	1	pound.
Soap (powered).....	2	pounds.
Glycerin.....	1½	gallons.
Tragacanth.....	10	ounces.
Oil of bitter almond.....	4	drachms.
Oil of bergamot.....	2	drachms.
Water, enough to make.....	10	gallons.

Pour hot (not boiling) water over the almonds, and blanch as soon as possible ; then make 5 gallons of emulsion of these with cold water. Dissolve the soap in 1 gallon of water ; melt the wax and spermaceti and add the expressed oil ; to this add the soap solution, and stir briskly. Next introduce the tragacanth and glycerin (which must have stood over night with 1 gallon of water), and beat briskly, after which add enough water to

make 5 gallons. After this mixture has become about lukewarm, add the emulsion of almonds, and finally the remaining oils, and then strain.—*Drugg. Circ.*, July, 1906, 241.

"Pansy Cream"—*Formula*.—Luther Marshall recommends the following formula for preparing a toilet cream which has given good satisfaction and has proven a popular seller under the name of *"Pansy Cream"*:

Quince seed.....	3 drachms.
Glycerin	3 ounces.
Boric acid	15 grains.
Carbolic acid.....	1 drachm.
Alcohol	4 ounces.
Glycerite of starch	5 ounces.
Water, enough to make.....	40 ounces.
Tincture of benzoin	1 drachm.

Macerate the quince seed in about a pint of water over night and strain through muslin without pressure. Dissolve the boric acid and mix the carbolic acid in the glycerin, add the glycerite of starch, and mix with the quince-seed mucilage. Add the tincture of benzoin little by little to the remainder of the water, and then mix with the balance of the mixture. Perfume with extract of pansy blossom.—*Bull. Pharm.*, Aug., 1906, 323.

Face Enamel—*Formula*.—H. C. Bradford recommends the following formula for a *"Face Enamel"*:

Precipitated chalk.....	12 ounces.
Zinc oxide	12 ounces.
Lead carbonate	12 ounces.
Glycerin	8 ounces.
Alcohol.....	16 ounces.
Ext. white rose	4 ounces.
Water	2 gallons.
Sol. carmine, 40 drops, or enough to make it a flesh color.	

Care must be exercised in bottling this that each bottle gets its proper part of the powder. An excellent plan is to mix the powders for the required number, well together, then divide in the usual manner and transfer each portion to its bottle. The liquids are now mixed, and the bottle filled.—*West. Drugg.*, Sept., 1906, 514.

"Black Eye Paint"—*Preparation and Method of Use*.—L. A. Lebowich recommends the following as a convenient *"Black Eye Paint"* which he suggests might be profitably exploited under some fanciful name such as *"French Cosmetique"*: Melt a quantity of zinc ointment and triturate it with sufficient carmine to give it nearly a flesh color (somewhat lighter than No 18. *"rouge de theatre."*) Put this up in very small ointment pots. With starch and carmine prepare a flesh-colored powder, and put this up in small turned wood boxes, of the same diameter as the ointment pot. Enclose these with a No. 00B camels hair pencil in a suitable

wrapper, and label the package with the following directions: Apply the salve thickly in the center, shading off thin toward the edges. Then brush the powder over the salve, lightly removing the excess of powder with a piece of cotton.—Merck's Rep. Dec., 1906, 358.

Dandruff Cure—Formula.—H. C. Bradford recommends the following formula for a "Dandruff Cure":

Chloral hydrate.....	30 grains.
Tannin	30 grains.
Resorcin.....	60 grains.
Glycerin	2 drachms.
Tr. Cantharides	4 drachms.
Bay Rum	1 ounce.
Water, q. s.	8 ounces.

M. Stand as long as convenient and filter. It is best to defer adding the glycerin, until after filtration.—West. Drugg., Sept., 1906, 514.

Liquid Shampoo—Simple Formula.—Criticizing a formula for a so-called "egg shampoo," which contains no "egg," but instead some coloring matter (tincture of curcuma) and much alkali, besides other unnecessary ingredients, Paul Caldwell recommends a simple solution of cottonseed-oil soap (having only 1 per cent. of free alkali) in alcohol and perfuming the "liquid shampoo" so obtained. Most of the green soaps on the market he finds are too strongly alkaline to begin with, and addition of more alkali is not only unnecessary but is quite objectionable.—Drugg. Circ., July, 1906, 241.

"Stock" Remedies—Formulas Suggested by Mr. Ebert.—In his last contribution to Meyer Brothers' Druggist (July, 1906, 193) the late Albert E. Ebert suggests the following formulas for "Stock" preparations:

1. CONDIMENT FOR CATTLE.

Salt, common	16 av. ozs.
Wheat flour.....	16 av. ozs.
Corn meal.	16 av. ozs.
Linseed meal	8 av. ozs.
Gentian, powder	4 av. ozs.
Fenugreek, powder	3 av. ozs.
Capsicum, powder	1 av. oz.

Mix. A few tablespoonfuls with each morning and evening feed.

2. FOR HORSES.

Salt, common	16 av. ozs.
Oat meal.....	16 av. ozs.
Corn meal.	16 av. ozs.
Linseed meal	8 av. ozs.
Gentian, powder	4 av. ozs.
Fenugreek, powder	2 av. ozs.
Ginger, powder	2 av. ozs.

Mix. Dose as preceding.

3. FOR HOGS.

Salt, common	16 av. ozs.
Sodium bicarbonate	16 av. ozs.
Sodium sulphate	16 av. ozs.
Antimony sulphide.....	2 av. ozs.
Gentian, powder	8 av. ozs.
Sulphur, powder	6 av. ozs.

Mix. Give a tablespoonful with each morning and evening feed.

4. FOR SHEEP.

Rye flour.....	32 av. ozs.
Linseed meal	16 av. ozs.
Sodium bicarbonate.....	7 av. ozs.
Sodium sulphate.....	7 av. ozs.
Capsicum, powder	1 av. oz.
Ginger, powder	1 av. oz.

Mix. Give a tablespoonful with each feed.

Condition Powder.

Sodium sulphate	8 av. ozs.
Sulphur	4 av. ozs.
Fenugreek	4 av. ozs.
Antimony sulphide.....	2 av. ozs.
Gentian.	2 av. ozs.
Ginger.....	2 av. ozs.

Reduce all to powder and mix. A tablespoonful with each feeding.

Hog Cholera Remedy.

Sodium bicarbonate.....	8 av. ozs.
Sodium chloride.....	8 av. ozs.
Sodium hyposulphite.....	8 av. ozs.
Sulphur.	4 av. ozs.
Charcoal	4 av. ozs.
Antimony sulphide	4 av. ozs.

Reduce all to powder and mix. Directions: A large tablespoonful for each 200 pounds of animal should be given at each feeding.

Horse and Cattle Powder—Approved Formula.—A. Magoffin recommends the following formula for a horse and cattle powder, which came to him in 1856, and which as here given has been in successful use since 1871:

Powdered copperas	5 pounds.
Powdered rosin.....	5 pounds.
Powdered sulphur.....	5 pounds.
Powdered saltpeter.....	3 pounds.
Ground oil cake.....	10 pounds.
Powdered asafetida.....	3 pounds.
Powdered alum	3 pounds.

Mix carefully by means of sieve.

Directions: Give a horse a heaping spoonful every morning, in wet oats or provender, for six or eight mornings; afterward, the same every other day for a few days. The same dose for a hog or cow, and double the quantity for an ox. There is no disease among horses and cattle in which this valuable powder may not be used with profit.—Drugg. Circ., May, 1907, 348.

Insect Destroyers—Formulas.—H. C. Bradford gives formulas for moth powder, moth paper and a mosquito destroyer which have proven serviceable and effective:

Moth Powder is prepared as follows:

Tar camphor.....	32 ozs.
Colcynth.....	8 ozs.
Snuff.....	2 ozs.
Insect powder.....	6 ozs.
Borax.....	4 ozs.
Filler.....	16 ozs.
Oil turpentine.....	2 ozs.

Mix all the powders well together, spread out on a sheet of paper and sprinkle the oil evenly over the whole. Then mix again and pass through a fine sieve. It should be put in a tight package, preferably the usual insect powder cans. The "filler" is usually bran, sawdust, corn meal, etc. If desired, perfume can be added to this powder, oil of cedar being very appropriate, and also adding materially to its efficacy. This powder will be found to give perfect satisfaction for destroying moths and that class of pests.

Moth Paper, in the form of fragrant sheets which are placed in the folds of garments or other articles it is desired to protect, is prepared as follows:

Phenol.....	1 oz.
Camphor.....	1 oz.
Oil cedar.....	1½ oz.
Gasoline.....	16 ozs.

Dissolve the camphor in the phenol and add, with the oil to the gasoline. Shake well until dissolved. Now cut some blotting paper into pieces about 3 by 6 inches, soak them in the liquid and hang up to dry.

Mosquito Destroyers are small cones, each weighing about a drachm, which are made as follows:

Powd. charcoal.....	16 ounces.
Powd. saltpeter.....	2 ounces.
Insect powder.....	8 ounces.
Phenol.....	1½ ounces.

Mix the powders well. Dissolve the saltpeter in a small quantity of

water, sprinkle the solution on the powder, then form a stiff mass by the aid of mucilage of acacia or tragacanth, and from this shape cones of the required size and thoroughly dry them. In use, they are to be placed in a dish and lighted at the apex with a match. They burn slowly, and give off a dense-pungent smoke that is sure death, not only to mosquitoes, but all other insects. The room should be tightly closed while the cone is burning, and afterward should be well aired.—West. Drugg., May, 1907, 243.

Polishes—Approved Formulas.—H. G. Bradford gives formulas and directions for preparing polishes suitable for a variety of purposes, which he has found reliable for the purpose for which they are recommended and popular with his customers. A

"*Universal*" *Polish*, which will serve equally well for a grate polish, shoe polish, wood stain, furniture lacquer, and a thousand other purposes where a jet black, glossy, enamel finish is desired, is prepared as follows: Shellac, 4 ozs.; Venice turpentine, $1\frac{1}{2}$ ozs.; sandarac, 5 drs.; aniline black, 2 drs.; turpentine (oil? Rep.). 2 fl. ozs.; wood spirit, 36 fl. ozs.; mix; set aside in a warm place, shaking occasionally, until dissolved. Carefully decant the clear liquid from any sediment, using the latter with the next lot to be made. Do not strain or filter. The polish adheres well to metal, wood, leather, paper, straw or other substances. While it cannot be used as a stove polish, it is with advantage used on the cooler parts, and is unexcelled for finishing hot water and radiator pipes, and as a preservative for the stove and its appurtenances during the season of storage. But as an application for shoes and leather goods in general, a somewhat more flexible, or

Shoe Polish may be obtained by the following modification of the preceding formula: Shellac, 3 ozs.; castor oil, 1 dr.; sandarac, 1 dr.; Venice turpentine, 1 dr.; aniline black, 1 dr.; wood spirit, 16 fl. ozs. To be prepared like the preceding. The addition of half an ounce of castor oil to the first formula would probably produce a still better product, since the proportions are better balanced than in the second formula.—Merck's Rep., Febr., 1907, 31-32.

White Shoe Dressing—Formula Recommended by Mr. Ebert.—The following formula for a white shoe dressing suitable for kid was recommended by the late Albert E. Ebert in his last contribution on "Working Formulas" to Meyer Brothers' Druggist (July, 1906, 193):

Zinc oxide	2 av. ozs.
Pipe clay	4 av. ozs.
Bleached shellac	3 av. ozs.
Borax	1 av. oz.
Sugar	2 av. ozs.
Glycerin	1 fl. oz.
Water, boiling	10 fl. ozs.

Dissolve the borax in the boiling water, add the shellac, continue heat and stir until the shellac is dissolved, then remove from the fire, add the sugar and glycerin, stir in the pipe clay and zinc oxide, and while still warm apply with a sponge, and give polish with not too much friction with a soft brush.

C. NEW REMEDIES.

AND TRADE-NAMED SPECIALTIES.

Absorbine is the trade name given by its exploiters to a mercurial ointment.—Pharm. Ztg., li, No. 73 (1906), 808.

Acidol-Pepsin is the name given to pastilles combining the acidity of acidol (betaine hydrochloride) with pepsin in a stable form. These tablets are supplied in two forms I and II, the one strongly acid, containing in each 0.4 Gm. acidol and 0.1 Gm. pepsin, the other mildly acid, containing 0.05 Gm. acidol, 0.2 Gm. pepsin, and 0.25 Gm. sugar of milk.—Pharm. Ztg., li, No. 62 (1906), 690.

Acetylsalicylamide, recommended for therapeutic use, is prepared according to a German patent (177,054) by acting upon salicylamide with acetic acid anhydride in the presence of acetic acid. For example, 50 kgm. of salicylamide and 45 kgm. of acetic acid anhydride are mixed with 30 kgm. of 100 per cent. acetic acid, and the mixture is heated 5 or 6 hours at 80° to 90° C. On cooling acetylsalicylamide separates, is collected on a suction filter, and re-crystallized from chloroform or other suitable solvent. Acetylsalicylamide forms handsome white crystals, melting at 143°–144° C.; readily soluble in acetic acid, alcohol and benzol, less soluble in ether.—Pharm. Ztg., li, No. 95 (1906), 1053.

Adralgin is the name given to a Swiss specialty composed of cocaine, thymol and adrenalin, and recommended as an anesthetic, particularly in dentistry. It is supplied in sealed tubes, sterilized, each tube containing the required dose.—Pharm. Ztg., li, No. 73 (1906), 808.

Alformin is the name given to a concentrated solution of basic aluminum formate, recommended as a non-toxic antiseptic to replace, and superior to, liquor aluminii acetici, its antiseptic action being about two or three times stronger than that of the latter. It is an odorless liquid, containing about 16 per cent. of the basic aluminum salt, and is non-coagulable by heat. In use it is diluted with 8 to 10 parts of water for fomentations, or, for gargles and mouth-washes, 5 to 10 drops are added to a glass of water.—Pharm. Ztg., li, No. 56 (1906), 624.

Alsol-Creme is an ointment containing the so-called "alsol" (aluminum aceto-tartrate) as active constituent, and is recommended as a cooling and antiseptic ointment for wounds.—Pharm. Ztg., li, No. 80 (1906), 889.

Aluminum Caseinate, yellowish-white, tasteless powder, insoluble in water, and containing 5 per cent. of aluminum, is exploited as an internal astringent for the treatment of intestinal catarrh. It is given in doses of 0.25 to 0.3 Gm. several times a day and is claimed not to incite dyspepsia.—Pharm. Ztg., li, No. 69 (1906), 767; from Wien. Klin. Rdsch., No. 30, 1906.

Analgos is the name given to a specialty recommended as a local anesthetic in dentistry, which is stated to have the following composition: Thymol, menthol, phenol, aspirin, sodium chloride, each 1 Gm.; cocaine hydrochloride, 0.5 Gm.; diluted alcohol, 95 Gm.—Pharm. Ztg., li, No. 73 (1906), 808.

Anisothecobromin is the name given to a compound of theobromine sodium and sodium anisate, recommended as possessing the pharmacological activity of "diuretin," but as being free from detrimental effects on the heart's action. It differs from diuretin in containing sodium anisate instead of sodium salicylate, its composition being the following: $C_7H_7N_4O_4.Na.C_6H_4OCH_3COONa$. To obtain it, 45 parts of theobromine are combined with 10 parts of sodium hydroxide in hydroalcoholic solution; 38 parts of anisic acid and 21 parts of sodium carbonate (in solution? Rep.) are heated to boiling until all CO_2 is completely evolved; the two solutions are mixed, and carefully evaporated to dryness. The product is somewhat less soluble than diuretin, and contains 47.87 per cent. of theobromine.—Pharm. Post, No. 8, 1907; Pharm. Ztg., lii, No. 17 (1907), 170.

Anocit, *Ansal* and *Bigall*, are abbreviated synonyms adopted in Austria for "antipyrine-caffeine citrate," "antipyrine salicylate," and "bismuth subgallate."—Pharm. Ztg., li, No. 92 (1906), 1019; from Ztschr. d. (Esterr. Ap., v.

Anorrhal is the name given to gelatin suppositories for hæmorrhoids, each weighing 4 Gm., and containing: Sozoidol-sodium, 0.02; alumol, 0.0021; dist. extract hamamelis, 0.5; suprarenal extract, 0.002; zinc oxide, 0.4; glycerin, gelatin, distilled water, aa, q. s.—Pharm. Ztg. li, (1907), No. 44, 459.

Anthrasolin is the name given to a glycerin soap containing 20 per cent. of anthrasol, recommended particularly for the skin diseases of animals.—Mercks' Ber., 1906.

Antichlorotin is the name given to pills composed of hemoglobin, sulphur and calcined magnesia.—Pharm. Ztg., lii (1907), No. 9, 89.

Antikollämin, a specialty which is claimed to neutralize excessive uric and other acids in the blood and thus preventing a variety of ailments, has been examined by Zernik, who finds it to be composed of sodium benzoate, sodium hippurate, calcium fluoride, sodium carbonate and the phosphates of potassium, sodium, ammonium, calcium and magnesium.—Pharm. Ztg., lii (1907), No. 9, 89; from Stüdd. Apoth.-Ztg., 1907, No. 7.

Antiperiostin is the name given to a remedy formerly exploited by the name of

Ossoline, which is described as being a 30 per cent. solution of *cantharidinate of mercuric iodide* (? Rep.). It is used as embrocation in veterinary practice.—Pharm. Ztg., lii (1907), No. 17, 170.

Antipneumotochina is the name given to a specialty recommended as a healing and protective remedy for tuberculosis, which is to be administered subcutaneously. It is a sterilized fluid, containing besides a calcium formate-albumen compound, the essential protective constituent, also a body having the composition $C_{18}H_{21}NSO_4$, which is designated as "sulphocondroitinic acid."—Münch. Med. Wschr., 1906, No. 44; Pharm. Ztg., li, No. 89 (1906), 988.

Antirheumol is the name given to a 20-per cent. solution of salicylic acid-glycerin ester in glycerin and alcohol.—Pharm. Ztg., li, No. 56 (1906), 624.

Antivom is the name given to tablets of anaesthesin, which are recommended in dyspepsia, ulcerations of the stomach, nervous emesis, etc.—Pharm. Ztg., li, No. 97 (1906), 1074.

Aphthisin Syrup is the name now given to a syrup containing 9 per cent. of potassium sulphoguaiacolate and 1 per cent. of petrosulfolammonium, hitherto exploited under the name "Sirupus Guaiacoli Comp."—Pharm. Ztg., li, No. 92 (1906), 1019.

Argentum Carbonicum is supplied as a specialty in two modifications: the ordinary, well-known silver carbonate, a ponderous, tasteless, yellowish-white powder, quickly changing to a dark-brown on exposure to sunlight, and a so-called

Argentum Carbonicum solubile resist. G. II, in form of a clear, colorless, neutral, aqueous solution, containing about 0.250 Gm. of Ag in a liter, which remains clear and unchanged for several months if protected from light. The ordinary carbonate is claimed to replace effectually such silver specialties as argentamine, argonin, etc., while the solution of silver carbonate serves as a non-irritant substitute for solution of silver nitrate for injections, etc.—Pharm. Ztg., li, No. 56 (1906), 624; from Pharm. Post, 1906, No. 27.

Armadiaphtherin is the name given to a glycerin extract of a *Convolvulacea*, indigenous to New Zealand, designated as *Dichondra brevifolia*. It is described as being a thick, brownish fluid, having the odor of caramel and a taste, at first sweetish, then acrid and bitter. According to Henrotin this extract exerts a specific bactericidal action on Löffler's diphtheria bacilli, and it is therefore recommended as a local remedy and aid in the serum treatment of the disease. It is applied to the affected parts of the mucous membrane by means of a tuft of cotton.—Pharm. Ztg., lii, (1907), No. 17, 170; from Med.-technol. Journ. 1907, No. 4.

Arsenferratin (see Proceedings 1904, 608) is now supplied by its manufacturers in form of tablets, each containing 0.25 Gm. and representing 0.015 Gm. iron and 0.00015 Gm. arsenic (=0.0002 Gm. arsenic trioxide).—Pharm. Ztg., lii, (1907), No. 14, 137.

Arsol is the name given to a specialty, exploited as a nervine, which is said to contain phosphorus and calcium arsenate as active components.—Pharm. Ztg., li, No. 73 (1906), 808.

Arteriose is the name given to a ferro-manganic albuminate solution, free from alcohol, containing 4 per cent. of iron and 1 per cent. of manganese, which is supplied also with bromine (Brom-Arteriose) and with iodine, (Iod-Arteriose).—Pharm. Ztg., li, No. 92 (1906), 1019.

Arthrosan Tablets are described as a gout remedy permitting the administration of formaldehyde and sodium citrate in a separate state.—D. Med. Wschr., No. 5, 1907.

Asbradon is the name given to a specialty containing 0.0005 Gm. of arsenous acid in 15 Gm. (one tablespoonful) of "bradon" which see.

Aspirophen is the name given to a compound obtained by combining amido-acet-para-phenetidin (= amido-phenacetin) with acet-salicylic acid in molecular proportions. It is supplied in the form of a fine crystalline powder, melting at 200° C., moderately soluble in cold water, but very readily soluble in hot water. Pharmacologically it unites the well-known action of aspirin with that of amidophenacetin, and it is recommended as a remedy in muscular rheumatism, in acute or chronic articular rheumatism, in neuralgia, gout, migraine influenza, etc., in doses of 1 Gm. for adults and 0.5 Gm. for children, several times daily.—Pharm. Ztg., li, No. 73 (1906), 808.

F. Zernik finds that *aspirophen* is not a definite body, but a mixture of salicylic acid and monoacetylphenocoll in molecular quantities.—Apoth. Ztg., xxi, No. 102/103 (1906), 1054.

Asthmakarbon is the name given to asthma tablets composed of the compressed powder of the herbaceous portion and roots of a South American shrubby plant, belonging to the compositæ, which is designated as

Punaria ascochingæ (?)—According to Zehden this plant contains an amorphous, bitter, aromatically-odorous glucoside, a resin, and small quantities of oil. The tablets are each fastened on cylindrical sections of finely porous wood charcoal; this glows on ignition and evolves whitish vapors, which are claimed to give relief to persons suffering from asthma and mountain sickness.—Pharm. Ztg., li, No. 102 (1906), 1127; from Therap. Monatsh., 1906, No. 12.

Astrosogen is the specific prefix to a stomach powder (universal-magenpulver), composed of: Bismuth subnit., 50; magnes. carb., 12.0; sodium chlor., 10.00; sodim sulph., 3.0; sodium bicarb., 65.0; pepsin, 3.0; rhubarb root, 2.0.—Pharm. Ztg., li, No. 56 (1906), 624.

Athensa is the name given to the alcohol-free tinctura ferri Athenstaedt.—Pharm. Ztg., lii (1907), No. 12, 117.

Beta-Sulphopyrin is a compound of sulphanilic acid and antipyrine, which is recommended as a specific in iodism and in colds, influenza, etc. It is a water-soluble powder, having an acidulous taste, and is given in doses of 1 Gm. 3 to 4 times daily. It should not be confounded with the *Sulphopyrin* exploited as a remedy for migraine (see Proceedings, 1906, 708), which is the antipyrine salt of the para-amidobenzolsulphonic acid.—Pharm. Ztg., li, No. 100 (1906), 1105.

Beta-Sulphopyrin has been examined by Zernik, who finds it to be simply a mixture, composed of about 50 per cent. of sodium sulphanilate, 5 per cent. of sulphanilic acid, and 45 per cent. of antipyrine.—Apoth. Ztg., xxii, (1907) No 8, 78.

Bioglobin is a haemoglobin preparation which is distinguished by a certain originality from the large mass of other blood (or shall we say "slaughter house?" Rep.) medicaments of the market. For not even the vehicle, which is evidently intended to resemble wine in appearance and taste, is a natural product. It is said to be best obtained by dissolving 5 kgm. of fresh, liquid haemoglobin extract (33 per cent. haemoglobin) in 75 kgm. of lukewarm water, adding 20 kgm. of sugar and 1 kgm. of finely cut sultana raisins, and allowing the mixture to undergo fermentation at 35° R. for two days in a glass vessel covered with a punctured parchment paper cap. The mixture is then strained through a hair-cloth sieve, a solution of 50 Gm. of tartaric acid in 1 kgm. of water and 10 kgm. of 96 per cent. alcohol is added, and allowed to stand several days for subsidence before transferring it to bottles. Bioglobin so obtained is a clear, wine-like liquid, having the color of port wine, and an agreeable taste. It is claimed to contain 1.5 to 2 per cent. of pure haemoglobin, 7 per cent. of alcohol, 13 per cent. of sugar and 18 per cent. of extract (!? Rep.), and is recommended as a promotive and nutrient remedy in anaemic, nervous and convalescent conditions—Pharm. Ztg., lii (1907) No. 29, 302.

Bio-Malz is the name given to a stable liquid extract of malt containing phosphates, which is recommended as a nutrient and tonic for the sick and convalescent.—Pharm. Ztg., lii (1907), No. 49, 512.

Blaudium is the name given to a preparation of ferrous carbonate obtained by a process, patented in Germany, dependent on the ability of alkaline bicarbonates to react with powdered ferrous sulphate in the presence of glycerin or sugar syrup, and the prevention of oxidation by supplying an atmosphere of carbonic acid throughout the process. In the practical process the powdered ferrous sulphate from which atmospheric air has been expelled by carbonic acid is triturated with sufficient glycerin or syrup to form a smooth magma, the alkaline bicarbonate, from which the air has also been expelled by CO₂, is added in divided portions and with

continued stirring until the reaction (evolution of CO_2) is completed, 100 parts of ferrous sulphate requiring about 80 parts of potassium or sodium bicarbonate. Water saturated with CO_2 is then added to the product of reaction in sufficient quantity to dissolve the alkali sulphate formed, the mixture is allowed to stand so that the ferrous carbonate may subside, from which the supernatant solution is decanted, and the remainder separated by centrifugation. The "blaudium" so obtained is pure ferrous carbonate in form of a greenish-white powder of microscopic fineness.—Pharm. Ztg., li, No. 95 (1906), 1054.

Borovertin is the trade name given to "hexamethylene-tetramine triborate," a bitter, yellowish-white powder, which is soluble in water. It has the property of rendering alkaline urine acid, thus enabling the splitting-up of the hexamethylene-tetramine into formaldehyde and water, at the same time dissolving the uric acid, clarifying the urine and accelerating its excretion. It is recommended as a urinary antiseptic in doses of 1 to 4 Gm.—Pharm. Post, 1906, No. 41.

Borovertin is now described as a colorless crystalline powder, readily soluble in water, difficultly in alcohol, and insoluble in ether, having a faintly bitter taste, and containing only about 50 per cent. of hexamethylene-tetramine triborate, in which the boric acid is present in form of metaboric acid (HBO_2). The latter is converted in aqueous solutions into the hydrous acid (H_3BO_3), in which form it exerts its activity as a urinary antiseptic.—Pharm. Ztg., li, No. 98 (1906), 1085; from Berl. Klin. Wschr., 1906, No. 49.

Bradon is the name given to a nervine and antispasmodic specialty containing the fluidextracts of valerian, artemisia, orange, melissa and adonis, together with various bromides, as active constituents, and rendered palatable by sweetening and by flavoring with vanilla. A tablespoonful (= 15 Gm.) contains 3 Gm. of the bromides and the same quantity of all the fluidextracts named, with the exception of that of *adonis vernalis*, of which it contains only 0.1 Gm. The same preparation, containing 0.0005 Gm. of arsenous acid in 15 Gm., is supplied under the name of "*asbradon*." Both preparations are recommended as nerve tonics in doses of a tea- or tablespoonful, and are best given in water or tea.—Pharm. Ztg., lii, No. 8 (1907), 77.

Bromural is the name given to α -monobromisovalerianylurea N— $(\text{CH}_3)_2\text{CH} - \text{CHBr} - \text{CONH} - \text{CONH}_2$. It is supplied in the form of a white, faintly bitter, crystalline powder, sparingly soluble in cold water, more readily in hot water, in alcohol, ether, and alkalies, and is recommended as being a harmless hypnotic in doses of 0.6 Gm.

Buccavedrol is the name of a specialty supplied in form of capsules containing cedar oil and extract of kava, which is exploited as a gonorrhœa remedy.—Pharm. Ztg., lii, No. 41, (1907), 428.

Cærusantal Capsules are specially recommended for the treatment of gonorrhœa, are said to contain as active ingredients: pepsin, methylen-blue, salol, East Indian oil of santal, and oil of peppermint.—Pharm. Ztg., li, No. 73 (1906), 808.

Cerebos Salt is the name given to a Dutch specialty which, according to an analysis of van Ledden-Hulsebosch is composed of 97.36 per cent. of sodium chloride and 2.64 per cent. of calcium phosphate.—Pharm. Ztg., li, No. 60 (1906), 668; from Pharm. Weekbl., 1906, No. 26.

Chelaffinum Muriaticum Solut. is the name given to a 1:1000 solution of a suprarenal preparation, which is said to correspond in its chemical and physiological properties, with an adrenalin solution of the same strength.—Pharm. Ztg., lii. No. 1 (1907), 9.

Chirosoter is a solution of various waxy and balsamic substances in carbon tetrachloride, which is recommended as a protective against infection during operations, as well as for the antiseptic restriction of the field of operation. On evaporation it leaves a non-porous protective covering on the surface, to which it is applied, which is not removable by water alone, but readily with soap, alkaline tincture of soap, ether or benzin. The use of carbon tetrachloride as solvent has the additional advantage that the fluid is non-inflammable, so that it may be applied with impunity in the presence of flame, light or open stove-fire.—Pharm. Ztg., li, No. 101 (1906), 1118.

Chloroform Tablets, intended for the convenient generation of chloroform, are made by a German patent (176.063), which is described as follows: Chloralhydrate is mixed with anhydrous alkaline carbonates or with alkaline earths (including magnesia) and the mixture is compressed into pieces (or tablets) of suitable size. On exposure to water or watery solutions the components of this compressed mixture react upon each other, with formation of chloroform.—Pharm. Ztg., li, No. 98 (1906), 1055.

Citrocoll is the name given to a definite crystalline compound, obtained by the union of amido-acet-para-phenetidin (= amido-phenactin) and citric acid in molecular proportions, and having the formula $(C_6H_4.OCH_2.NH.CO.CH_2.NH_2)_3.C_6H_8O_7$. It is neutral, melts at $193^{\circ}C.$, and is readily soluble in water. It combines the pharmacologic action of its components and is recommended by its exploiters as an innocuous febrifuge, anti-rheumatic, nervine, and migrain remedy, in daily doses of 4–6 Gm. for adults, and 2–4 Gm. for children.—Pharm. Ztg., li, No. 73 (1906), 808.

Citrorheumin is the name given to a specific for gout and articular rheumatism, supplied in the form of tablets, 25 of these containing: Citarin, 10.0; citric acid, 5.0; quinine sulphate, 1.0; and colchicine, 0.01 Gm.—Pharm. Ztg., li, No. 56 (1906) 624.

Conephrin is the name given to a solution recommended for anesthetic

purposes, and said to contain cocaine and paranephrin as active constituents.—Pharm. Ztg., li, No. 56 (1906) 624.

Corona is the name given to a local anesthetic for dental use, represented to be an aqueous solution of less than 1 per cent. of cocaine, with nitric acid, picric acid, potassium hydroxide, gaultheria, baptisia, thyme, mentha arvensis, eucalyptus, benzoic acid and boric acid.—Pharm. Ztg., li, No. 76 (1906), 844.

Corrosol is the name given to a compound recommended for subcutaneous use in the treatment of syphilis, which contains mercuric succinate, mercuric cacodylate and novocaine or eucaine. It is supplied in 2-Cc. vials, each containing a quantity of mercury corresponding to 0.01 Gm. of corrosive sublimate.—Therap. Monatsh., 1907, No. 5.

Coryfin is the trade name given to the ethyl-glycolic acid ester of menthol, exploited as an external remedy for headache, nasal catarrh, etc.—Pharm. Ztg., lii (1907), No. 12, 117.

Creosapal, a new fanciful name for a creolin substitute.

Cystopurin is the name given to a double salt composed of 1 molecule of hexamethylene-tetramine and 2 molecules of sodium acetate, obtained by evaporating an aqueous solution of these components, in molecular quantities, to crystallization in a vacuum, but also obtainable by the direct interaction of formaldehyde, ammonia and sodium acetate. Cystopurin forms nearly tasteless, white, lanciform crystals, which are readily soluble in cold or warm water, and have the composition $(\text{CH}_2)_6\text{N}_4 \cdot 2\text{CH}_3\text{COONa} + 6\text{H}_2\text{O}$. It is recommended for the treatment of gonorrhœa in doses of 2 Gm., dissolved in water, 3 times daily, and also as a prophylactic.—Pharm. Ztg., lii (1907), No. 5, 48, and No. 18, 180.

Deleol is the name given to a prophylactic specialty for the prevention of gonorrhœa, which is composed of methylene blue, dry extract of equisetum and extract of star-grass. It is supplied in form of gelatin capsules, and is said to be so effective as to prevent the development of gonococci in the urethra within two hours after the administration.—Pharm. Ztg., lii (1907) No. 8, 77; from D. Med.-Ztg., 1907, No. 5.

Diabeteserin, which is stated by its manufacturers to contain, besides the salts of Trunczek's serum, eserine salicylate and atropine in certain definite proportions (see Proceedings 1906, 691), has been subjected to chemical examination by J. Kochs, who finds it to contain the alkaloids in the proportions claimed by the manufacturer. The specialty is supplied in two strengths, designated respectively as Diabeteserin I and II, both in the form of tablets. Diabeteserin I contains in two tablets the salts from 100 Cc. of blood serum and 0.0005 Gm. of eserine; while two tablets of Diabeteserin II contain in addition to these 0.0001 Gm. of atropine.—Pharm. Ztg., li, No. 53 (1906) 592; from Apoth. Ztg., xxi, No. 50, (1906).

Digitoxinum solubile titratum H. M. is the title given to a preparation exploited to replace the so-called "Digalen," which see.

Diphenylaminum thymico-benzoicum is the name given to a substitute for "Arhovin" by a competing firm.

Dolorant Tablets are a Swiss specialty recommended in aqueous solution as an anesthetic in the extraction of teeth. Each tablet is represented to contain 0.0001 Gm. adrenalin, 0.01 Gm. cocaine, and 0.00199 Gm. sodium chloride.—Pharm. Ztg., li, No. 76 (1906), 844.

Dorema is the name given to an aphrodisiac and tonic specialty which is apparently composed, similarly to the so-called "Amrita-Powder" of the same exploiters, of saccharated ferro-carbonate, rye meal, calcium phosphate and bitter substances, and besides these, licorice root, fennel oil and other components of compound licorice powder.—Pharm. Centralh. xlviii (1907), No. 15, 292.

Dulcinol-Chocolate is the name given to chocolate which is claimed to be sweetened with a natural sweetening agent, but neither with sugar or with a synthetic body, and is said to possess mild aperient properties. It is recommended as a substitute for ordinary sweet chocolate in diabetes, obesity, etc.—Pharm. Ztg., li, No. 77 (1906), 856.

Dulcinol, the sweetening substance employed in the preparation of the above "dulcinol-chocolate," is stated to consist of a mixture of mannite and sodium chloride. The latter is said to communicate an agreeable taste to the mannite. It is further stated that "dulcinol-chocolate" contains only about 9 per cent of carbohydrates.—D. Med. Wschr., No. 42, 1906.

Eggose is the name of a tonic and nutrient specialty, which according to Kochs is essentially a mixture of about equal proportions of oatmeal (with some wheat starch), sugar and cacao, and containing possibly also very small quantities of lecithin or of a substance naturally containing such.—Pharm. Ztg., lii, No. 37 (1907), 386.

Emanosal is stated to be identical with the new radium preparation described under the name of "radiansal" and like the latter is supplied in the form of tablets (see radiansal tablets) for the bath. These tablets, weighing 30 Gm. each, are readily soluble in water, in which they are said to generate a constant emanation of about 50,000 volts. Emanosal baths are particularly recommended for the treatment of rheumatic and gouty affections, neuralgia, etc.—Pharm. Ztg., lii, No. 51 (1907), 534.

Epileptol is the name under which an anti-epileptic remedy is exploited, which in its chemical characters resembles an amido-formic acid. The remedy is to be given in doses of 20 to 50 drops thrice daily only on physician's prescription.—Pharm. Ztg., li, No. 102 (1906), 1127.

Epilepsy Powder—Dr. Weil, is a specialty composed of 10 per cent. of

hemoglobin and acid albumin, 84 per cent. of iron bromide and 6 per cent. gentian bitter.—Pharm. Ztg., lii (1907), No. 1, 9.

Erotin is the name given to a specialty recommended as a remedy for impotence, which is said to contain celery root as active constituent.—Pharm. Ztg., lii (1907), No. 23, 235.

Escalin is the name given to a specialty recommended as a substitute for bismuth subnitrate as a hæmostatic in hemorrhages of the stomach and intestines, which is composed of finely-powdered aluminum, 2 parts, and glycerin, 1 part, and supplied in form of pastilles, each containing 2.5 Gm. of aluminum. Two of these pastilles are stirred up in half a glass of water, so as to produce a uniform suspension of the aluminum, and administered to the patient one or two hours before eating.—Therap. d. Gegenw., 1907, No. 5.

Eston and *Formeston* are aluminum compounds in form of fine, white, dry powders, very difficultly and slowly soluble in water, resistant to the action of light and air, and possessing unlimited stability. They are prepared by a patented process; *eston* being composed of basic aluminum acetate, whilst *formeston* is defined as being aluminum aceto-formate. Both preparations are recommended as effective antiseptic and astringent medicaments, which when applied to wounded surfaces, etc., are slowly split up into their components and thus exert prolonged action, while free from the irritant effect of other medicaments. They are applied in powder, usually in admixture with talc, starch, etc., diluted to 10–50 per cent., or in combination with balsam of Peru, and also in form of 10 per cent. ointment with vaseline or lanolin.—Pharm. Ztg., lii (1907), No. 39, 407.

Eucathymin is the name given to a whooping-cough remedy, said to contain as active constituents the sweetened extracts of *Eucalyptus globulus*, *Thymus vulgaris* and *Brassica napa*.—Pharm. Ztg., lii (1907). No. 17, 170.

Eucol is the name given by its exploiters to guaiacol acetate, a colorless fluid of sp. gr. 1.138, having an odor resembling guaiacol. It is miscible with ether or alcohol in all proportions, and to the amount of 20 per cent. in expressed oil of almond. At 235°–240° C. it boils, and is partially decomposed. Eucol is recommended as being a readily absorbable guaiacol preparation, and is administered both internally and subcutaneously—Pharm. Ztg., lii. (1907) No. 12, 117; from Boll. Chim. Farm., 1907, No. 2.

Eumerola, a specialty recommended for the treatment of female ailments of various forms, is stated to contain as active components: Extr. Tang-Kui. spissum (Eumenol), Extr. Viburni., Extr. Hydrastis canad., Lupulin, Ferrum bromatum, Apiol, and Sapo medicatus.—Pharm. Ztg., li, No. 73 (1906), 808.

Eupherin, a specialty recommended for the treatment of the different affections of the respiratory organs, is stated to contain in a coffeespoonful (= 5 Gm.) the following medicaments: Sodium guaiacolsulphonate, 0.4 Gm.; sodium glycerophosphate (50 per cent.), 0.4 Gm.; extract of thyme i.i (= fluidextract ? Rep.), 0.6 Gm.; cinnamylic acid, 0.0075 Gm.; arsenic, 0.0025 Gm.; aromatic syrup, 3.6 Gm. *Eupherin*, without arsenic, is also supplied.—Pharm. Ztg., lii, (1907), No. 45, 469.

Eupicin is the name given to a specialty said to be composed of formaldehyde and the active constituents of coniferous tar, which is recommended, for the treatment of skin diseases in form of ointments, liquid soap or acetone solution.—Pharm. Ztg., li, No. 56 (1906), 624.

Euquinine Iodhydrate, $\text{CO.OCC}_2\text{H}_5.\text{OC}_{30}\text{H}_{23}\text{N}_2\text{O.HI}$, is the name obtained according to Astruc and Cambe, on slowly and carefully pouring an aqueous solution of sodium iodide into an aqueous solution of euquinine, produced with the aid of lactic, citric or acetic acid. The iodhydrate forms white crystals, which readily change to yellow in moist air, and are sparingly soluble in water, but more readily in alcohol.—Pharm. Ztg., lii (1907), No. 15, 149; from Rép. d. Pharm. 1907, No. 2.

Euscopol is the name given to *chemically pure scopolamine hydrobromide* which is claimed to be distinguished from the official (G. P.) scopolamine hydrobromide in being free from associated bases and optically inactive, while the official compound is a mixture of active and inactive scopolamine hydrobromide. *Euscopol* softens at 165° – 170° , melts at 180° – 181° , and forms a clear liquid at 185° C. The melting-point is therefore not sharply defined, and reliance must be placed mainly on the optical distinction of the two compounds. Distinctive characters are also found in the crystalline form of the respective picrates—the picrates of the optically active scopolamine crystallizing in slender needles, whereas that of *euscopol* forms elongated, serrated leaflets. *Euscopol* is indicated in paralysis agitans, chronic and toxic spasms, and also as a general sedative and hypnotic in mental affections. The dosage is about ten per cent. higher than that of the official hydrobromide.—Pharm. Ztg., lii (1907), No. 16, 158.

Falkogen, exploited as a Hungarian remedy for tuberculosis, is said to be composed of 10 per cent. meat extract, 10 per cent. thyme extract, 65 per cent. aromatic elixir, and 15 per cent. "chinguajolum hypophosphoricum," the latter containing 70 per cent. of guaiacol.—Pharm. Ztg., lii, No. 37, (1907), 386.

Ferrolecithin is the name given to a specialty containing in 1 liter of sweet wine from the Island of Thyra, 1.25 Gm. of vegetable lecithin, 0.95 Gm. of phosphoric acid and 1.42 Gm. of ferric oxide in organic combination.—Pharm. Ztg., lii, No. 25, (1907), 253.

Fluoralbin is the name given to vaginal suppositories containing a yeast preparation heretofore described by the name of "zymin" (see *zymin-bougies* in Proceedings, 1904, 635).—Pharm. Ztg., lii, No. 9, (1907), 89.

Forgenin is the name given by Nanzetti to tetramethylammonium formate, which is readily obtained by the action of freshly precipitated silver formate on a moderately diluted solution of tetramethylammonium iodide, resulting in the formation of insoluble silver iodide while tetramethylammonium formate remains in solution with possible traces of silver formate. The latter is removed by the careful addition of hydrochloric acid, drop by drop, and the filtrate is concentrated to crystallization over sulphuric acid or lime. The salt crystallizes with difficulty and is quite hygroscopic. Its solutions are neutral, when prepared from the dry salt, but readily become alkaline when heated. Given in large doses it has curare-like action: in small doses it is restorative and promotes the appetite.—Pharm. Ztg., li, No. 76 (1906, 844; from Boll. Chim. Farm., Aug., 1906.

Forgenin (*Forgénine*) has the formula $\text{HCOON}(\text{CH}_3)_4$. It is now stated that its aqueous solution may be heated without decomposition, and that the lethal dose is 0.01 Gm. per kilo of animal weight.—*Ibid.*, li (1906), No. 5, 49; from Journ. de Pharm. et Chim., xxiv (1906), No. 11.

Formamint, a specialty marketed in form of tablets and recommended for throat affections, colds, etc., is described as a loose combination of formaldehyde and lactose to which the formula $\text{C}_{12}\text{H}_{22}\text{O}_{11}(\text{CH}_2\text{O})_8$ may be applied. The pure substance forms colorless, extremely hygroscopic crystals, readily soluble in water, and, though at first tasteless, having a burning taste characteristic of formaldehyde. After prolonged drying in the the exsiccator, the compound melts at 88°C .—Pharm. Journ., Jan. 5, 1907.

Formidin is the name given by its American manufacturers to a condensation product obtained from iodine, formaldehyde and salicylic acid, which is claimed to be a definite chemical compound, $\text{C}_{15}\text{H}_{10}\text{O}_2\text{I}_6$, and designated as methylene-disalicylic acid iodide. It is supplied in the form of a red-yellow powder, insoluble in water, alcohol and the usual solvents, but splitting up in the alkaline juices of the organism into its original components. Formidin is recommended as a wound antiseptic to replace iodoform.—Pharm. Ztg., lii, (1907), No. 29, 302; from Therap. Gaz., 1907, No. 3.

Formurol is the name given by its exploiters to a citrate of hexamethylene-tetramine-sodium, having the composition $\text{C}_6\text{H}_8\text{O}_7\text{Na} \cdot \text{C}_6\text{H}_{12}\text{N}_4$. It is supplied in form of a white, crystalline powder, readily soluble in water, and having an agreeable taste. Pharmacologically it combines the action of urotropin and sodium citrate, and is recommended in cases of gout, inflammation of the kidneys and urinary passages, and in phosphaturia and gravel, in doses of 1 Gm., 2 to 5 times daily.—Pharm. Ztg., li, No. 73 (1906), 808.

The investigations of F. Zernik prove *Formurol* to be simply a mixture of

about 37.5 per cent. of hexamethylene-tetramine with 62.5 per cent. of a mixture of neutral and acid sodium citrate.—Apoth. Ztg., xxi (1906), Nos. 102-193, 1085.

Fulgural is the name given to a blood purifier, which is stated by its manufacturers to be prepared according to the following formula: Cort. frangul., fol. senn., rad. ononid., lignum sassafras, lignum guajaci, herb. centaur., herb. menth. pip., \AA 10.0; rad. sarsaparill., 20.0; magnes. sulfuric, 100.0; extr. trifolii, extr. primul. ver., ext. junip., extr. liquir., \AA 5.0; sacchar., 50.0; spiritus, 100.0; vinum, ad 1000.0.—Pharm. Ztg., li, No. 67 (1907), 747.

Gadose, the new ointment base prepared from cod-liver oil (see Proceedings, 1906, 694), is now supplied in combination with woolfat. The new preparation melts at 37.5°C. , gives the Hübl. iodine number, 43.7, saponification number, 152, and acid number, 0. Among other gadose mixtures

Gadose Gelatinata has also been introduced by the manufacturer. It contains 10 per cent. sterilized gelatin.—Pharm. Ztg., li, No. 56 (1906), 625.

Grandira-Creme is the fanciful name given to a calomel ointment prepared as recommended for the treatment of syphilis by Professors Roux and Metchnikoff (10 calomel to 30 lanolin). It is exploited as a preventive of syphilitic contagion.—Pharm. Ztg., li, No. 59 (1906), 659.

Guaiacol-Perdynamin is a mixture of perdynamin (see Proceedings 1901, 640) with 5 per cent. of guaiacol, and is claimed to have the combined activity of its components.—Pharm. Ztg., lii, No. 17 (1907), 170.

Hæmatopan is the name of a dry hæmoglobin preparation, easily digestible, and containing about 40 per cent. of extract of malt. It is supplied in form of ruby-red lamellæ which are readily soluble in water, and have an agreeable odor and taste.—Pharm. Ztg., li, No. 73 (1906), 808.

Hæmostan, noticed in last year's report (see Proceedings, 1906), is stated to have the following composition: Extr. hydrastis, extr. gossypii, extr. hamamelidis, of each 3 Gm.; chininum hydrochloricum, 1 Gm.; radix hydrastis, 9 Gm.; divided into 100 tablets, which are supplied sugar-coated. In cases of hemorrhages, the remedy is recommended to be given in doses of 3 tablets after meals.—Pharm. Ztg., li, No. 73 (1906), 808.

Hæmotrophinum Arseniatum is the name given to a hæmoglobin preparation containing 0.005 per cent. of arsenic.—Pharm. Ztg., li, No. 56 (1906), 625.

Haltn is the name given to a specialty in powder form exploited as a general tonic for disturbances of metabolism, which is composed, according to the statement of the manufacturers, of 30 per cent. carbohydrates, 20 per cent. albuminates, 10 per cent. fatty matter, 8 per cent. casein, 2

per cent. nuclein, 4 per cent. gelatin and 8 per cent. inorganic and organic salts of various kinds.—Pharm. Ztg., lii (1907), No. 48, 499.

Helfoplast is the trade name given to Collemplastrum Adhesivum Mite by its manufacturer.

Helgotan is the name given to a methylene-tannin compound exploited as a substitute for tannoform. It is a faintly-colored substance and insoluble in water.—Pharm. Ztg., li. No. 95 (1906, 1905).

Helgotanum Bromatum is the name given to a specialty described as being a bromo-tannin-methylene compound.—Pharm. Ztg., lii (1907), No. 48, 499.

Herbosanum is a name given to a mixture of herba galeopsidis grandifl., herba polygalæ amaræ, herba farfaræ, lichen islandicus, radix liquiritiæ, semen phellandrii aquatici, semen anisi, and semen foeniculi. The proportions are not stated. The mixture is recommended for tea which is claimed to be useful in catarrhal affections of the respiratory passages.—Pharm. Ztg., li, No. 67 (1906), 747; from Berl. Klin. Wschr., 1906, No. 33.

Herbstkatarhserum (Hay-fever Serum) is the name given to a specialty which is produced, similarly to Pollantin (see Proceedings, 1904, 627), from the pollen of certain species of Ambrosiaceæ, Solidagineæ and Graminaceæ.—Pharm. Ztg., li, No. 56 (1906), 625.

Herniapillen, a specialty exploited as a remedy for gonorrhœa are pills, each weighing 0.5 Gm., containing a mixture of the following ingredients in the proportions indicated: Extr. herniariæ compositum (? Rep.), 10 Gm.; oleum santali, 5 Gm.; salol, 2.5 Gm.—Pharm. Ztg., li, No. 73 (1906), 808.

Horta is a dark brown, agreeably tasting liquid, which is described as a mixture of equal parts of Peru-cognac and extract of malt, and is exploited as an expectorant and dietetic.—Chem. Ztg., 1907, No. 14.

Hydrargolent is the name given to a substitute for mercurial ointment supplied in soft gelatin capsules, each containing 3, 4 or 5 Gm., with a $33\frac{1}{3}$ or 50 per cent. metallic mercury content.—Pharm. Ztg., li, No. 67 (1906), 767.

Hydrozol-Preparations are various forms of medicaments containing hydrogen dioxide in fixed combination as active component, the following being described:

Hydrozol Paste, supplied for dermatological purposes, has a base consisting of a gelatinous mass, which is said to retain the H_2O_2 unchanged for a long time.

Hydrozol Pastilles, which are composed of the same mass, are intended for internal use.

Hydrozol Tooth Paste is produced from a base obtained by treating cal-

cined gypsum with solution of hydrogen dioxide. It is said to contain 1.5 per cent of H_2O_2 .—Pharm. Ztg., li, No. 86 (1906), 953.

Hygiopon is the name given to an iron preparation, obtained by an electrical method, in which the iron is contained in a minutely divided condition and is claimed to possess marked electrolytic activity. Its presence in the metallic state can be demonstrated with certainty, but in its clinical behavior it reminds of the organic form developed in the human and animal organism. It is described as being a golden-brown, thin liquid substance, having a pronounced, not disagreeable, taste of nutgalls, and a chlorine-like odor. On heating, the color changes to a deeply-dark golden-brown, and the products of distillation, after condensation, give a faint chlorine reaction in contact with potassium iodide starch paste. It is not immediately miscible with water, the individual drops sinking to the bottom before dissolving; while in alcoholic liquids and in milk the compound is decomposed. It has the sp. gr. 1.205, is in the main quite stable, but should be protected from direct sunlight or from exposure to high temperature. Hygiopon in drop doses promotes the appetite and acts as a general tonic, without producing unpleasant by-effects when given in moderate quantities.—Pharm. Ztg., li, No. 91 (1906), 1011.

Hygiopon has been subjected to analysis by Bischoff, who found 100 Cc. of the preparation to contain: Ferrous chloride, 20 Gm.; ferric chloride, 3.76 Gm.; sodium chloride, 2.8 Gm.; free hydrochloric acid, 6.67 Gm.—Ibid., lii (1907), No. 10, 96.

Ichtharsol is the name of a specialty containing arsenic and ichthyol-ammonium, and recommended for skin affections.—Pharm. Ztg., li, No. 73 (1906), 803.

Ichthyat is the name of an ichthyol substitute obtained in a similar manner to the latter from a mineral found near the Achensee in the Karwendel Mountains. It is supplied in the form of an ammonia compound, and is claimed to replace the ichthyolsulphonate in every respect.—Wien. Klin. Rdsch., 1907, Nos. 7 and 8.

Ichthyopon is the name given by a Swiss firm to the ammon. sulphichthyolate of the Pharm. Helvet.

Ichtolithium and *Ichtosincum* are names applied to the lithium and zinc salts of ichthyolsulphonic acid respectively, salts which have long been employed medicinally.—Schweiz. Wschr. f. Chem. u. Pharm., xlv, No. 41, 692.

Injektion Hirsch is the title of a specialty containing 1 per cent. of mercuric oxycyanide and 0.5 per cent. of acoine in stable solution.—Pharm. Ztg., li, No. 62 (1906), 690.

Iodalbin is the trade name of an iodine-albumen compound containing 21.5 per cent. of iodine which is exploited by its American manufacturers

as a substitute for the alkaline iodides commonly prescribed. It is soluble in alkaline fluids, but not in water or acids.

Iodferol is the name given by its exploiters to an iodoferrated codliver oil.

Jodin is the name given to a compound obtained by the action of iodine vapor on the purified fat of the peanut (*Arachis*), and is claimed to be "propyl-diiodoleic acid-mono-iodarachic acid ether." It is a blackish, oily fluid, having a fatty odor, and rather unpleasant taste, and is recommended as being an iodine preparation which does not produce iodism when administered internally.—Münch. Med. Wschr., 1907, No. 6.

Iodipinum Phosphoratum is a specialty recommended in rachitis and scrofulous affections of children in teaspoonful doses, given several times daily. It is said to contain 10 per cent. of iodine and 0.0033 per cent. of phosphorus.—Pharm. Ztg., lii (1907), No. 15, 149.

Iodofan is the trade name given for monoiododioxymethyl-formaldehyde ($C_6H_5I(OH)_2.HCOH$), obtained by the action of iodine on formaldehyde and dioxymethyl, and recommended as an odorless, non irritant wound antiseptic, in form of dusting powder or ointment. It occurs in form of a reddish-yellow, crystalline, odorless and tasteless powder, which is soluble in the usual solvents.—Pharm. Ztg., li, No. 77 (1906), 856.

Irosyl is the name given to a specialty, in form of pills, recommended for the treatment of anaemic conditions in general, and containing ferric-sodium pyrophosphate, potassium bromide and quinine hydrobromide as active components.—Pharm. Ztg., li, No. 73 (1906), 808.

Ischaemin is the name given to a solution of the "crystallized suprarenal principle" (adrenalin?).—Pharm. Ztg., lii (1907), No. 5, 49.

Isn is a liquid preparation having an agreeable taste, and containing 0.2 per cent. of ferrous saccharate.—Pharm. Ztg., li, No. 92 (1906), 1019.

Kankroidin is a preparation, obtained from a mucor cultivated from human carcinoma, which is used in form of injections for diagnostic purposes, just as "tuberculin" is used for the treatment of tuberculosis. It is said to produce specific reaction in cases of cancer and sarcoma, and when administered in increased doses it is claimed to effect the healing of cancerous abscesses. The smallest effective dose is 0.0000025 Gm.—Pharm. Ztg., lii, No. 49, (1907), 512.

Kaliol is the name given to a soap powder containing 10 per cent. of *xyol*, which see

Kephaldolom is the name given to a compound produced by the action of citric and salicylic acid on phenetidin, in which the free acid remaining after the reaction is neutralized with quinine and with sodium carbonate. It is supplied in form of a yellowish-white powder, having a faintly bitter taste; difficultly soluble in water, but comparatively easily in alcohol.

It is recommended as an antipyretic, antineuralgic, and antihydrotic remedy, the maximum single dose being 2.0 Gm., the daily dose 5.0 Gm.—Pharm. Ztg., li, No. 73 (1906), 808.

Koladiastatin is the name given to a specialty recommended as a general tonic, which is supplied in the form of pastilles, composed of extract kola nut and diastatin. Each pastille contains 0.01 Gm. caffeine.—Pharm. Ztg., li, No. 56 (1906), 625.

Kolaferri, a nerve tonic specialty, contains in a coffeespoonful (= 5 Gm.): 0.25 Gm. trifirrin (iron paranaclinate); 0.4 Gm. extract of kola; 0.4 Gm. tincture of cinchona; 0.0015 Gm. strychnine; 4.0 Gm. syrup of orange.—Pharm. Ztg., lii (1907), No. 45, 469.

Korysan is the name given to a hæmatogen compound with carbonic acid, which is probably similar to the so-called "euboise" (see Proceedings, 1902, 792), a preparation of hæmatogen rendered stable by the introduction of CO₂.—Pharm. Ztg., li, No. 89 (1906), 988.

Kurin is the name given to purgative tablets composed of compound licorice powder and phenolphthalein.—Pharm. Ztg., li, No. 73 (1906), 808.

Lacto is the name given to a nutrient specialty prepared from the casein and whey of milk, having the following percentage composition: 36.03 peptones and other digestion products of albumen; 1.90 tyrosin; 0.30 amines and lecithin; 0.673 fat; 3.21 lactose; 0.757 lactic acid; 13.66 caramel and non-nitrogenous extractive matter; 17.38 soluble salts (among these 9.02 per cent. monopotassium phosphate); 5.82 insoluble salts; 20.27 water. The preparation is described as a light-brown, doughy mass, having an agreeable taste reminding of toasted bread. It is readily soluble in warm water and completely sterilized.—Pharm. Centralh., xlvii (1906), No. 52, 1074.

Laryline is the name given to a Hamburg specialty supplied in the form of a plaster, and recommended for the treatment of whooping-cough.

Laxirkonfect is the name given to a specialty containing phenolphthalein, with apple-pulp as the base.—Pharm. Ztg., li, No. 73 (1906), 808.

Lecioplasma is a nutrient and tonic specialty, containing as essential active component 5 per cent. of lecithin, together with aromatics.—Pharm. Ztg., lii (1907), No. 25, 253.

Lecithin-Kraftwein (tonic wine) is represented to be a sweet wine, produced on the Island of Thyra, containing 0.13 per cent. of natural vegetable lecithin (see also "ferrolecithin").—Pharm. Ztg., lii, No. 25 (1907), 253.

"*Lentoids*" are lentil-shaped compressed tablets of Italian manufacture, containing the medicaments in effervescent admixture.—Pharm. Ztg., lii, No. 5, (1907), 49.

Limoinin, which is exploited as a substitute for citarin (anhydromethylene citrate of sodium), has been found by Eihengrcin to be a mixture of paraform and sodium citrate.—Südd. Apoth. Ztg., No. 5, 1907.

Linosan Capsules are capsules containing 0.1 Gm. of each of the following oils: ol. santal. optim. (East Indian), ol. juniper. e bacc. bis rect., and ol. lini rec. par. pur. They are recommended in doses of six per day as a specific in gonorrhœa, and 2 to 5 per day in catarrh of the bladder.—Pharm. Ztg., li, No. 62 (1906), 690.

Liquor Ferri Subformici is a preparation corresponding to and recommended as a substitute for liquor ferri subacetici. It is a dark red-brown fluid containing 3.8 per cent. of ferric oxide, equivalent to 7.7 per cent. $(\text{HCOO})_4(\text{OH})_2\text{Fe}_2$, and is recommended as a tonic uniting the pharmacologic activity of iron and formic acid.—Merck's Ber., 1906.

Litonbrod (liten bread) is the name of a bread recommended for diabetics, which is prepared from the so-called "glidin" (wheat gluten) and rye-sprouts, deprived as far as possible of carbohydrates by treatment with malt. It retains only about 3 to 10 per cent. of carbohydrates, and possesses the advantage of having an agreeable bread-like taste.—Pharm. Ztg., lii, No. 12, (1907), 117; from Berl. Klin. Wschr., No. 4, 1907.

Lithosanol is the name given to a pharmaceutical monstrosity which is apparently closely related to a similar monstrosity described in last year's report under the name "Lithosan," and exploited, like the latter as a remedy for biliary and kidney affections. It resembles the latter also in the heterogenous character of its components, but differs widely in actual components, as may be seen by comparing the following formula with that given for lithosan (see Proceedings, 1906, 698):

• Agrimony (*Agrimonia eupatoria* L.), 40.0; goat's beard (*Spiraea aruncus* L.), 20.0; juniper, 5.0; chamomile (Japanese), 5.0; star anise, 3.0; extr. condurango mataperro, 10.0; extr. colæ, 15.0; herb. robellæ (*Drosera rotundifolia* L.), 15.0; extr. kava-kava, 15.0; sodium chloride, 10.0; salicylic acid (free, 2.0; oil of peppermint, 0.5; oil of angelica, 0.5; French cognac, 20.0; extr. cinchona, 10.0; lithium citrate, 9.0. These quantities are (presumably) represented in the original 2-liter bottle in which the preparation is supplied.—Pharm. Ztg., lii, (1907), No. 5, 49.

Lysan is the name given to a saponaceous wound antiseptic which is recommended also for the disinfection of the hands and instruments of the surgeon. It is described as an agreeably odorous fluid, having an alkaline reaction, and miscible with water, glycerin, or alcohol, and is said to be obtained by the action of formaldehyde on certain terpenes and allied substances, such as eucalyptol, menthol, eugenol, etc., the product of the reaction being dissolved in a hydro-alcoholic medium containing also soap.—Pharm. Zeit., lii, (1907), No. 29, 302.

Lysargin is the name given to a colloidal silver of special manufacture.

It is supplied in the form of steel-blue lamellæ, which dissolve readily and rapidly in water, forming a bright yellow-brown solution.—Pharm. Ztg., li, No. 56 (1906), 625.

Maltosikat is stated to be pure extract of malt in form of powder.—Pharm. Ztg., lii, (1907), No. 1, 9.

Manka Capsules is the name given to a specialty for gonorrhœa, said to contain East Indian sandal oil, arbutin and ethereal extract of buchu.—Therap. Monatsh., 1907., No. 7.

Manketan is the name given to an ointment-like Swiss specialty, recommended particularly in veterinary practice for contusions, inflammations, and particularly malanders. It contains as active constituent the specialty exploited under the name of "trigenol."—Pharm. Ztg., lii (1907), No. 29, 302.

Mensalin is the name given to a specialty exploited as a nervine and sedative remedy, and recommended particularly in nervous, stomach and intestinal affections and in the treatment of menstrual disorders. It is defined to be "diphenylbioxycarbonate of dimethylpyrazolon-hexahydrocymol valerianate," and is supplied in form of tablets, the compound itself being a white, somewhat hygroscopic powder.—Pharm. Ztg., lii (1907), No. 15, 149.

Menthymin is a new name for the whooping-cough remedy heretofore exploited under the name "Menthussin," and described in Proceedings, 1906, 699.

Metramin is the trade name given to specially recrystallized hexamethylene-tetramine, for which its exploiters claim exceptional purity.—Therap. Monatsh., 1907, No. 4.

Migrainin, and numerous similar compounds exploited as substitutes for it, has been examined by F. Zernik, who finds them all to be simply mechanical mixtures of antipyrine, caffeine and citric acid, which are well replaced by the "Antipyrinum caffeino-citricum" of the Pharm. Austr., viii. This furnishes a snow-white, permanently dry preparation, which is made by dissolving 90 parts antipyrine, 9 parts caffeine, and 1 part citric acid in water, filtering the solution, and evaporating it to dryness.—Apoth. Ztg., xxi, No. 64 and 65 (1906), 673 and 686.

Miroplaster is the trade name given to a rubber adhesive plaster supplied by a German manufacturer.

Monotal is the name given to the ethylglycolic acid ester of guaiacol ($C_7H_5OCH_2COOC_2H_4OCH_3$), which is described as a colorless oil, boiling in a vacuum under 25 Mm. pressure at $170^\circ C.$, and, under certain conditions, solidifying and melting then at $30^\circ C.$ It has a faint aromatic odor, a sp. gr. of 1.130 to 1.131 at $20^\circ C.$, and is only very sparingly soluble in water, but soluble in olive oil to the amount of about 30 per cent.

Monotal is recommended as a remedy in neuralgias, etc.—Therap. Monatsh., 1907, No. 2.

Muiracithin, an aphrodisiac specialty mentioned in the report of 1905 (see Proceedings 1905, 544), is now stated to have the following quantitative composition: Fluidextract. muirae puamae, 100 Gm., and ovolecithin, 5 Gm., are made into a mass with sufficient pulv. rad rhei, and divided into 100 pills, which are coated with silver.—Pharm. Ztg., li, No. 67 (1906), 748; from Therap. Neuh., 1906, No. 6.

Myristina is the name given to a fat obtained from the seeds of *Myristica sebifera*, which has recently been introduced as a nutrient and as a base for ointments. It has the odor and taste of cacao butter, melts at 37° C., and is soluble in alcohol, ether, chloroform and oil of turpentine.—Pharm. Centralh., xlviii (1907), No. 5, 95.

Nastin is the name given by Deycke and Reschad to a pure, crystallizable fatty body obtained from the lepra bacillus, which is claimed to be effective for the treatment of lepra, but particularly for the purpose of producing immunity. It is obtained by fractional extraction of carefully cleansed streptothrix cultures obtained from milk, with ether, and purified by treatment with hot alcohol, ether, etc., and forms a solid, white, paraffin-like substance, which has been determined to be the glycerin ester of a highly molecular fatty acid. It is best administered in 1 per cent. sterilized solution in olive oil, prepared hot, and subsequently heated just sufficient to again clarify after cooling. The dose (once a week) is 0.005 Gm., increased to 0.1 Gm.—Pharm. Ztg., lii (1907), No. 8, 78; from D. Med. Wschr., 1907, No. 3.

Natrium Thymico-Benzoeicum is the name given to a substitute for "pyrenol" by a competitor.

Néosiode is the name given by Chevrotier to "iodcatechin," obtained by prolonged heating of an aqueous or alcoholic solution of catechin to which iodine is gradually added in small portions at a time. On cooling the iod-catechin is deposited in form of a yellow, amorphous powder, which is difficultly soluble in cold water, more readily in hot water, and easily in alcohol, ether, or acetone. It is not affected by light or air, but under the oxidizing influence of living organisms, and by acids and by hydrogen dioxide it is decomposed. It has the composition represented by the formula $(C_{15}H_{14}O_6, 3H_2O)_3I$, and giving off iodine slowly when introduced into the organism per os or subcutaneously; it is recommended as an easily assimilated, non-irritant substitute for the iodine preparations heretofore in use for internal as well as external treatment.—Pharm. Ztg., li, No. 67 (1906), 748; from Nouv. Reméd., No. 14, 1906.

Nerve-Regenerative Tablets, Dr. Weil, are a specialty composed of lecithin, iron lactate, sodium glycerophosphate, and Dr. Leube's stomach powder—the latter composed of 7.5 parts each of rhubarb and sodium sul-

phate, and 5 parts of sodium bicarbonate.—Pharm. Ztg., lii (1907), No. 1, 9.

Neurofebrin is the name given to a mixture of equal parts of "neuro-nal" (bromdiethylacetamide) and acetanilide, which is recommended as an analgesic and sedative, particularly in the treatment of diseases of women.—Ber. d. D. Pharm. Ges., 1907, No. 2.

Neurasin Tablets, a specialty recommended for migraine, is said to contain bromides, valerian, quinine, salipyrin and guarana. Proportions not mentioned.—Pharm. Ztg., lii (1907), No. 1, 9.

Novargan (see Proceedings, 1905, 547) has recently been mentioned in the medical and pharmaceutical literature as novargan II and novargan III. It is now mentioned by the manufacturer that the original preparation as well as novargan II have been withdrawn, and that novargan III is now to be understood when "novargan" is prescribed. The new preparation, like the original, is a compound of silver and a protein acid, containing 10 per cent. Ag., but is characterized by greater astringency with less irritant action.—Pharm. Ztg., li, No. 98 (1906), 1085.

Novaspirin is the name given to the methylene-citric acid ester of salicylic acid, which is recommended as an excellent substitute for saline salicylates. It is supplied in form of a white powder, almost insoluble in water, readily soluble in alcohol, and having a faint acidulous taste, and is recommended in doses of 1 Gm. several times daily, in influenza, colds, etc.—Pharm. Ztg., lii, (1907), No. 1, 9.

Novaspirin splits up into its components on prolonged contact with water, more rapidly in contact with alkalis, and when heated it melts with evolution of formaldehyde. From the alkaline solution salicylic acid, in form of white needles, separates on the addition of dilute acids.—*Ibid.*, No. 5, 49.

Novorenal is the name given to sterilized solutions of novocaine and adrenalin in physiological salt solution for convenient use in dental operations. They are supplied in various strengths suitable for the intended use in hermetically sealed tubes.—Pharm. Ztg., li, No. 69 (1906), 767.

Ouatplasme is the name given to a sterilized Parisian bandaging material, composed of a cotton fabric saturated with an antiseptic mucilage and dried. It is softened by moisture and may then be applied in place of ordinary fomentation and poultices.—Pharm. Ztg., lii, (1907), No. 8, 78.

Ozet-Baths is the name applied to bath-additions, which in the doses supplied are said to develop 22 liters of ozonated oxygen.—Pharm. Ztg., lii, No. 1 (1907), 9.

Ozet-Baths are according to A. Lagneur produced by two distinct sub-

stances, sodium perborate and manganese borate. The sodium perborate is dissolved in the bath and the manganese borate, which acts simply as a catalytic, is then added in a uniformly divided condition, whereupon a regular evolution of oxygen is evolved for 15 or 20 minutes in form of minute bubbles.—*Ibid.*, No. 5, 49; from *D. Med. Wschr.*, No. 1, 1907.

Para-Lysol is the name given to an alkali-cresol compound which is supplied in the form of tablets consisting of white crystals, melting at 146° C., and containing, according to A. Nieter, 8.3 per cent. potassium and 91.7 per cent. of cresol.—*Pharm. Ztg.*, lii, No. 41 (1907), 429.

Paraxin is the name given to dimethylaminoparaxanthin, which is recommended as a diuretic possessing about the same activity as diuretin. It is, however, not free from by-effects, which consist of gastric disturbances and nausea. Paraxin is supplied in form of white, felty, crystalline masses, difficultly soluble in cold water, readily in hot water, and in water rendered faintly alkaline or acid. It forms readily-soluble salts with the alkalies, and melts at 226° C., with formation of a sublimate. The dose recommended is 0.5 Gm. once to four times daily.—*Pharm. Ztg.*, lii (1907), No. 12, 117; from *Arch. f. Exper. Pathol. u. Pharm.*, 1907, 186.

Pavykol is the name given to tablets, recommended for diabetes, which are said to contain the extracts of *syzygium jambolanum*, *rad. lappae officin.* and *herb. rhododendri ferruginei*, together with lactic acid, tincture of iodine, salol and extract of opium.—*Pharm. Ztg.*, lii (1907), No. 5, 49; from *Therap. Neu.*, 1906, No. 12.

Pepsorthin is the name given to a stomachic remedy, recommended in case of deficiency of pepsin and hydrochloric acid in the gastric juice. It is said to contain papain, magnesium superoxide, benzonaphthol and sodium bicarbonate (? *Rep.*).—*Pharm. Ztg.*, li, No. 59 (1906), 659; from *Berl. Klin. Wschr.*, 1906, No. 28.

Peptannol is the name of a preparation which permits the simultaneous administration of hydrochloric acid and tannin in a palatable form. It represents an aromatic, wine-like fluid, containing 2 per cent. of the officinal (G. P.) hydrochloric acid and 0.5 per cent. of tannin, in which the unpleasant taste of the latter is completely masked, and is recommended as a specific in acute and chronic catarrh of the stomach and as a prophylactic against gouty affections.—*Pharm. Ztg.*, lii, (1907). No. 49, 512.

Perglutyl is the name given to a solid form of hydrogen dioxide, obtained according to a German patent (No. 185,597) by dissolving sufficient gelatin in solution of hydrogen dioxide, by the aid of moderate heat, to form a solid mass after the addition of glycerin and cooling. The proportions of gelatin and glycerin vary in accordance with the desired melting point, the pergulutyl supplied melting between 25° and 40° C. It

is used both internally and externally as an antiseptic and disinfectant agent.—Pharm. Ztg., lii, (1907), No. 44, 459.

Pesterine is the name given to a "plague disinfectant," the use of which is described in a paper read before the Bombay Medical and Physical Society by Dr. John A. Turner, Executive Health Officer of the Bombay Municipality. The substance to which he has given this name is the residue of the distillation of crude petroleum, and is practically the same as what is termed in France *l'huile de schiste*, a product which has been found very efficacious for killing flies. *Pesterine* very readily destroys fleas, and Dr. Turner considers these insects to be very important agents in the transmission of plague. It has been definitely ascertained, he says, that fleas from plague-infected rats contain the *Bacillus pestis* in their stomachs, and that susceptible animals, such as rats, guinea-pigs, monkeys, or rabbits, will contract plague if put into a room with infected fleas. He also states that plague bacilli are to be found in the fæces of infected fleas, and that this material, if rubbed into a susceptible animal's skin will produce fatal infection from the disease.—Pharm. Journ., Jan. 19, 1907, 55.

Phytinum Liquidum is the product of the last stage in the preparation of phytin, before its transformation into the dry, powdery form. It is supplied in sterilized glass containers.—Pharm. Ztg., li, No. 86 (1906), 953.

Piscin is the name given to a German substitute for cod-liver oil recommended particularly in homeopathic practice.—Pharm. Ztg., No. 97, (1906), 1074.

Pittika-Soap is a solid dermatological potash soap containing 2, 5 and 10 per cent. of *pittulen*, and supplied also in combination with other medicinal additions.—Pharm. Ztg., lii (1907), No. 25, 253.

Prepared Hempmeal is the meal of hemp seed from which the fixed oil has been removed by means of benzin, and is recommended, in the form of soups, as a substitute for phosphorated cod-liver oil and other phosphorus preparations as a nutrient and tonic for children. Hemp seed contains about 2.36 per cent. of P_2O_5 , corresponding to 1 per cent. of phosphorus, together with about 22 per cent. of nitrogenous substances (albuminoids, etc.) and 13.6 per cent. of carbohydrates; also 26.3 per cent. cellulose and 30–31 per cent. of fixed oil.—Pharm. Ztg., lii (1907), No. 25, 259.

Radiosal is a radio-active saline compound for the bath.

Radiosal-Tablets are composed of saline crystals containing in each tablet a dose of radium emanations, for a bath, corresponding to a volt-decline of about 20 to 30 thousand units, and sufficing to render the water of a "full-bath" distinctly radioactive. The dose may, of course, be increased as desired by the use of several tablets.—Pharm. Ztg., lii (1907), No. 49, 512.

Reclus' Ointment is made according to the "Formulary of Bull. gén de Therap." (1906, 151, 744) with: Powdered iodoform, 1; salol, 2; powdered boric acid, 5; antipyrine, 5; vaseline, 40. The ointment is antiseptic, deodorant, and analgesic; it is suitable for dressing all wounds, especially those which are suppurating or are in a state of doubtful asepsis.—Pharm. Journ., Sept. 22, 1906, 323.

Regenerol (Tabulettæ Salis Physiologici Effervescentes). Tablets described as containing physiological salt (? Rep.) and effervescent sodium citrate and characterized by producing perfectly clear solutions with aqueous fluids, an agreeable faint saline taste, and pronounced activity.—Pharm. Ztg., li, No. 59 (1906), 659.

Rheumon (Collonin Extensum) is the name for a rheumatism remedy consisting of camphor, benzol, Mecca balsam, Canada balsam and fluid-extract of arnica, formed into a mass and thinly spread upon paper, or also on bandaging.—Ztschr. d. Oesterr. Ap.-Ver., No. 14, 1907.

Rhinoculin is the specific name applied to a powder, a spray solution, and a "creme," containing paranephrin and anæsthesin as active constituents, and recommended for the treatment of eye and nose affections and for hay-fever.—Pharm. Ztg., li, No. 56 (1906), 625.

Rhome Tablets, a specialty recommended for impotence and pollution, contain in each dose: Yohimbine hydrochloride, 0.005 Gm.; strychnine nitr., 0.002 Gm.; ginger, 0.04 Gm.; vanilla sugar, 0.02 Gm.; calcium phosphate 0.1 Gm.—Pharm. Ztg., lii (1907), No. 45, 469.

Salenal (Unguentum Saleni) is an ointment containing 33⅓ per cent. of "Salen," which has been previously described (see Proceedings, 1905, 550). It is recommended as a non-irritant antirheumatic remedy.—Pharm. Ztg., li, No. 89 (1906), 988.

Samos is the name of a French specialty recommended for sweetening wines, which is said to be a solution of saccharin in glycerin.—Pharm. Ztg., lii (1907), No. 37, 386.

Sapalcol is an ointment-like alcoholic soap, which is recommended for the disinfection of the hands and for dermatological purposes.—Med. Klin., 1906, No. 50.

Sapozon is the trade-name given to an oxygenated soap, suggested by Professor Geissler, which is said to be non-irritant and to give off oxygen when applied. Its active constituent is a perborate—probably sodium perborate. The soap is recommended mainly as a disinfectant, deodorant and bleaching agent for toilet use, and for the treatment of various skin affections.—Pharm. Ztg., lii (1907), No. 20, 202.

Scarlatin-Marpmann is an antitoxin serum obtained from animals rendered immune to the toxin of scarlet fever, which is recommended for the treatment and prevention of scarletina. It is supplied in form of an

opalescent, slightly yellowish fluid, having a faint odor and a salty taste. It has the sp. gr. 1.012-1.013, a neutral reaction, and gives precipitates with picric acid, tannin, potassium ferrocyanide, mercuric chloride and auric chloride.—Pharm. Ztg., lii, (1907), No. 5, 49.

Scopomorphin is the name given to a sterilized solution, supplied in sealed tubes, each containing 0.0012 Gm. of scopalamine hydrochloride and 0.03 Gm. of morphine hydrochloride, in sufficient distilled water to make 2 Cc. The preparation is exploited for convenient use in producing the modernly popular so-called "scopolamine-morphine narcosis," and the claim of the manufacturer that the scopalamine used for its preparation is distinguished from other scopalamines of the market by its freedom from producing side-effects. The content, of a single tube is sufficient to produce the narcosis required for an operation, and is administered, as a rule, in three portions, hypodermically: One-third, $2\frac{1}{2}$ -3 hours before the the expected narcosis, another an hour after the first, and the third portion about $\frac{3}{4}$ of an hour before the operation.—Pharm. Ztg., li, No. 80 (1906), 889.

Sepedelen Salt is described as being a so-called physiological salt containing "plant alkalies" (? Rep.), which is supplied as a substitute for the water-cures of Carlsbad and Neuenahr.—Pharm. Ztg., lii (1907), No. 1, 9.

Sic is the trade name of a serum prepared from the suprarenal gland of the ox, which is recommended as an internal remedy for whooping-cough in doses of 5-10 drops for infants and 75-150 drops for adults. It is a light-yellow, clear liquid, and has been kept unchanged for over two years.—Pharm. Ztg., lii (1907), No. 17, 170.

Solykrin Pills, exploited as a preventative and remedy for puerperal fever, are composed of 15 parts of solveol, 5 parts of lysol and 2 parts of creolin.—Pharm. Ztg., li, No. 95 (1906), 1055.

Stagophor is an Austrian specialty recommended as a prophylactic against gonorrhœal infection. It is composed of a glass tube containing a 20-per cent. protargol-glycerin solution, and a vial containing 10 pastilles, each composed of 1 Gm. mercuric oxycyanide.—Pharm. Ztg., li, No. 98 (1906), 1085.

Subeston is the name by which, in distinction from esters and formesters (which see), a pulverulent form of aluminum acetate is designated. It is described as being a sparingly soluble bibasic salt, of the composition $Al_2(C_2H_3O_2)_2(OH)_2$, and is recommended as a non-irritant, antiseptic, astringent and deodorant dusting powder for the treatment of wounds.—Ibid., lii (1907), No. 51, 534.

Sudoformal is the name given to a soft formaldehyde soap, which is supplied in two strengths: the one containing 10 per cent. of formalin, recommended for the treatment of foot-sweat; the other, containing 40

per cent. of formalin, for the disinfection of the body, of instruments, and of utensils.—Pharm. Ztg., li, No. 56 (1906), 625.

Sudol is the name given to a remedy for foot-sweat, which is composed of: Wool fat, 65; glycerin, 15; paraffin ointment, 15; formaldehyde, 3; oil of wintergreen, 2 parts.—Pharm. Ztg., li, No. 56 (1906), 625.

Sulfopyrin, which has been described as the antipyrine salt of para-amidobenzolsulphonic acid (see Proceedings, 1906, 709), has been subjected to chemical examination by F. Zernik, who finds it to be simply a mixture of 86.5 p. antipyrine and 13.5 p. of sulphanilic acid—not a definite chemical compound.—Apoth. Ztg., xxi, No. 53 (1906), 549.

Suptol is the name given to a bacteria preparation, prepared by the method of Burow, which is exploited for the subcutaneous treatment of acute and chronic epidemic diseases of the hog.—Berl. Tierärztl. Wschr., 1907, No. 23.

Syrolat is the name given to a substitute for "Sirolin," a specialty described in Proceedings, 1899, 489.

Tannothymal is the trade-name given to "tannin-thymol-methane," a condensation product of formaldehyde, thymol and tannin. It is obtained according to Hildebrandt by mixing an alcoholic solution of thymol with an aqueous solution of tannin, adding two or three times the calculated quantity of 40 per cent. formaldehyde solution, pouring the mixture, with assiduous stirring, into 20 times the quantity of concentrated hydrochloric acid and, after standing some time, diluting with water. The precipitate formed is collected in a filter, well washed and dried. So obtained, tannothymal is a whitish, tasteless powder, melting at 235° C., and soluble in alcohol and in alkali. It is exploited as a remedy in serious forms of diarrhoea, and is claimed to have given good results when administered in doses of 0.5 Gm. to a teaspoonful several times daily.—Münch. Med. Wschr., 1907, No. 25.

Tebecidin is the name given to a preparation made from the tubercular bacilli cultivated from the sputum, blood, urine and sweat of old cases of phthisis. It is supplied in form of a weak alcoholic, yellowish fluid, and is recommended in chronic pulmonary affections as an aid to the so-called "tebecin" treatment, in drop doses three times daily, beginning with 3 drops, and increasing to 5 or 6, and finally 250 drops.—Pharm. Ztg., li (1907), No. 8, 78.

Theolactin is the name of a specialty, claimed to be a double salt of theobromine-sodium and sodium lactate, from which it is prepared, forming a white hygroscopic powder, soluble in water, and having a bitter taste. It has proven to be an active diuretic in doses of 1 Gm. administered several times daily, but is not free from unpleasant by-effects when administered per os, being liable to produce emesis and loss of appetite. This

may, however, be avoided if the remedy is administered per rectum.—Pharm. Ztg., lii (1907), No. 49; from Therap. d. Gegenw., 1907, No. 1.

Theonasal is the name given by its exploiters to theobromine-sodium salicylate.

Theyolip is the name given by a competitor to a sulphur ointment which has heretofore been exploited under the name "Thiolan," described in Proceedings, 1905, 544.

Thymophen is the name given to a liquid specialty exploited by a Berlin manufacturer as an antiseptic and analgetic remedy.—Pharm. Ztg., li, No. 76 (1906), 844.

Thymylum Trichloraceticum (see Proceedings, 1906, 710), according to the experiments of Anselmino, cannot be obtained by the process given, but may be obtained by the interaction of thymolsodium and trichlor-acetylchloride in petroleum ether. So obtained, it is a colorless fluid, which however gradually acquires a blue-green color when exposed to the air and is very easily saponified. Under a reduced pressure of 12 Mm., it boils at 110°–111° C.—Pharm. Ztg., li, No. 98, (1906), 1085; from Ber. d. D. Pharm. Ges., 1906, No. 8.

Tiodin, or Thiodin, is described by v. Boltensstern as being a true chemical compound of ethyl iodide and thiosinnamin. It is a white crystalline body, melting at 68° C., having the molecular weight 271, and containing 46.49 per cent. of iodine, while soluble in water in all proportions, it is more difficultly soluble in alcohol. The dose, subcutaneously or per os in pills, is 0.1 to 0.2 Gm. daily.—Pharm. Ztg., lii (1907), No. 32, 333; from D. Aerzte-Ztg., 1907, No. 7.

Tisopyrin-Pastilles, a specialty recommended for pulmonary tuberculosis, are said to contain in each dose 0.1 Gm. acetyl-salicylic acid, 0.1 Gm. camphoric acid and 0.00025 Gm. arsenous acid.—Pharm. Ztg., lii (1907), No. 1, 9.

Tithen Pills, recommended for the treatment of the various forms of stomach, intestinal and bladder affections of persons suffering with pulmonary diseases, anaemia, rheumatism, etc., are stated to contain 30 per cent. ichthyol-sodium phosphate, 60 per cent. "plant alkalies" (? Rep.), and 10 per cent. of extractive matter having diuretic activity.—Pharm. Ztg., lii (1907), No. 1, 9.

Tonol is the generic name adopted by a manufacturing firm to identify and distinguish the glycerophosphates of their make from those of other manufacturers. Thus, the glycerophosphates of iron, sodium, potassium, lithium, etc., are supplied under the designations: ferro-, natrio-, kalio- and lithio-tonol respectively.—Pharm. Ztg., lii (1907), No. 29, 302.

Trypanrot (trypan-red) is the name given to a specialty consisting of a brown-red coloring matter belonging to the class of benzo-purpurines,

which is soluble in water, and is claimed to be a specific for cancer of the stomach and for inflammations of the lymphatic glands. It has been administered both per os and subcutaneously; in the latter case 0.5 Gm. dissolved in 40 Cc. of artificial serum and heated to 35° C. before injection into the thigh,—Pharm. Ztg., li, No. 62 (1906), 690.

Tuberculophobine, apparently a Dutch specialty, is composed, according to van Ledden-Hulsebosch, of a 10-per cent. decoction of *Ramalina Fraxinea* colored with syrup of coffee, to which more or less alcohol is added as preservative.—Pharm. Ztg., li, No. 60 (1906), 668; from Pharm. Weekbl., 1906, No. 26.

Tuberkulin Béraneck is a Swiss specialty containing toxins which on administration primarily establish a certain tolerance, and in connection with this a greater resistance to tubercular infection. It is administered subcutaneously in form of very dilute solutions.—Schweiz. Wschr. f. Chem. u. Pharm., xlv, No. 35 (1906), 586.

Tuberal is the name now adopted for *Tuberculo-albumin* (which see in Proceedings 1903, 705) by the original manufacturer, with the object of distinguishing it from the product exploited by another manufacturer under the original name.—See Pharm. Ztg., li Nos. 89, 90 and 92 (1906, 988, 998 and 1019).

Turicol is the name given by a Swiss manufacturer to a nutrient preparation, which is essentially composed of vegetable albumen with small quantities of animal albumen and carbohydrates, the total albumen content being about 75 per cent. The preparation is colored red, probably with red santal wood.—Pharm. Ztg., li, No. 84 (1906), 932.

Tylmarin is the name given to acetyl-ortho-cumaric acid, which is claimed to have the same pharmacologic action as acetylsalicylic acid in the same doses (0.25 to 0.5 Gm.) It occurs in form of colorless crystals, difficultly soluble in water, and is split up in the organism into its components.—Amer. Drug., Dec. 24, 1906.

Udrenin is the name of an American specialty containing beta-eucaine and adrenalin as active constituents.

Ulcerol is the name given to a plaster of balsam of Peru, which is recommended for the treatment of ulcers and granulating wounds, the treatment being usually complemented by the application of

Ulcerol pasta by inunction of the surfaces surrounding the wound. The latter, also, is recommended for the treatment of weeping eczemas, burns, chafing, and hæmorrhoids.—Pharm. Ztg., li, No. 56. (1906), 625.

Unguentum Saposalicylatum Bengen is a brown-yellow, ointment-like mass, composed of superfatted soap containing 12 per cent. salicylic acid and 12 per cent. salicyl esters, which is intended for the treatment of acute articular inflammations and inflammation of the tendons of horses and cattle.—Thierärztl. Wschr., 1906, No. 38.

Urticolin is the trade-name given to a dialyzed extract of nettle (*urtica*), which is exploited as a remedy in chronic urticaria.—Pharm. Ztg., lii (1907), No. 19, 194.

Vaginol is an Austrian specialty, in form of gelatin suppositories, each containing 0.002 Gm. mercuric oxycyanide, 0.08 Gm. sodium sozoiodol and 0.02 Gm. alummol, exploited for the treatment of catarrhal affections of the female genital organs, pruritis vulvae, vaginismus, etc.—Pharm. Ztg., lii, No. 98 (1906), 1085.

Valda Pastilles, a French specialty recommended for the treatment of coughs, colds, hoarseness and ailments of the respiratory organs in general, are said to contain in each dose: Eucalyptus oil, 0.0005 Gm.; menthol, 0.002 Gm.; sugar, 0.5 Gm.; gum, 0.5 Gm.; chlorophyll, q. s.—Pharm. Ztg., li, No. 59 (1906), 659.

Valifluid is the trade-name for a fluidextract of valerian prepared without the aid of heat in the usual proportions (1:1).

Valinervin, exploited by the same manufacturer, is described as an effervescent "valerian bromide," whatever that may be, in Pharm. Ztg., lii (1907), No. 35, 363.

Van Gorkam's Magenpulver (stomach powder), a Dutch specialty, is composed, according to an analysis of H. v. d. Wielen, in round numbers, of 30 per cent. sodium bicarbonate, 10 per cent. bismuth subnitrate, 7 per cent. magnesium carbonate, and 48 per cent. powdered rhubarb.—Pharm. Ztg., li, No. 60 (1906), 668; from Pharm. Weekbl., 1906, No. 29.

Velopural is a saponaceous specialty, prepared with the aid of olive oil so as to form an unctuous mass, which is recommended as a vehicle for mercury previously extinguished with lanolin. Under the name of *Mercury Velopural* the latter is employed for the treatment of diseases requiring mercurial inunction.—Therap. Monatsh., 1907, No. 5.

Vinopyrin is the name given to a migraine remedy which is represented to be a compound of p-phenetidin and tartaric acid. It is supplied in form of a white crystalline powder, soluble in water, but incompatible with alkalies, and is recommended in doses of 1 Gm. several times daily.—Pharm. Ztg., lii (1907), No. 25, 259.

Virisanol is the name given to an aphrodisiac remedy which is stated by the manufacturer to contain as active constituents a dried extract of *Muira puama* and ovoidlecithin.—Pharm. Ztg., li, No. 56 (1906), 625.

Viscolan is the name given to a new ointment base containing as substantial constituents purified *viscin* (see Proceedings, 1901, 647 and 705). It is described as being a nearly odorless, sticky mass, drawing out into threads of the consistency of thick honey and a yellowish-green color, which is suitable for direct application to wounds, or combined with medicaments in great variety.—Pharm. Ztg., lii (1907), No. 1, 9.

Weissol is the trivial name of a catarrh powder, which is used by insufflation into the nose and throat, and is said to contain hypophosphites and peroxides as active constituents.—Pharm. Ztg., li, No. 102 (1906), 1127.

Xyol is the name of a formaldehyde-soap preparation, exploited in competition with the so-called "lysoform," which has a similar composition. It is supplied by the manufacturer, like lysoform, in two forms, designated respectively as "xyol purum" and "xyol purissimum," the first-named corresponding to "crude lysoform."—Pharm. Ztg., li, No. 97 (1906), 1074.

Zeamin is the name given to a preparation of maize in the form of meal, which is recommended as an addition to milk and other foods for children.—Pharm. Ztg., li, No. 60. (1906), 668.

Ziethen's Dropsy Powder is a specialty recommended to the medical profession for prescriptions. It is said to be composed of 15 parts extr. ononidis, 10 parts extr. cort. sambuci, 15 parts arum maculat., 5 parts scilla maritima, 10 parts sodii sulphas sicc., and 10 parts potassii sulphas pulv.—Pharm. Ztg., li, No. 89 (1906), 988.

Zimphen (*Zimphène*) is the name given to the sodium salt of metaoxycyan-cinnamic acid, which is supplied in form of yellow crystals, difficultly soluble in cold water, but soluble in aqueous solutions of sodium acetate or alkalies, and readily soluble in alcohol. The salt has a bitter taste, aromatic odor, and melts at 224° C., decomposing above this temperature. Pharmacologically its mission is that of a gastric and intestinal antiseptic, promoting in a marked degree also the flow of the glandular secretions in doses of 0.5 Gm., dissolved in water, administered before meals. Its antiseptic properties may also find useful application in other directions, since even in 0.25 per cent. solutions it arrests the growth of *Aspergillus niger*.—Pharm. Ztg., lii (1907), No. 5, 49; from Rép. de Pharm., 1906, No. 12.

Zinkonal is the name given to an antiseptic preparation, similar in composition to the so-called "zinc perhydrol" (zinc superoxide), which is recommended as a wound antiseptic.—Pharm. Ztg., li, No. 56 (1906), 625.

Zitrovinessig (citro-wine-vinegar) is the name given to a concentrated vinegar the total acidity of which is due to the amount of 40 per cent. to citric acid. It is recommended in place of ordinary vinegar for table use by gouty and rheumatic individuals.—Pharm. Ztg., li, No. 60 (1906), 668.

MATERIA MEDICA.

GENERAL SUBJECTS.

Medicinal Plants—Cultivation in German East Africa.—The recent report of the "Biologisch-Landwirtschaftlichen Institute in Amani" (1906, vol. 8) gives some interesting information concerning the progress of culture experiments with medicinal plants in German East Africa. The

Cinchona plantations have continued to develop favorably. During the fiscal year 2700 plants of *Cinchona robusta* were set out, the plantation now containing also other cinchona plants, as follows: 6587 *Cinchona ledgeriana*, 9049 *C. succirubra* and 3658 hybrids.

Erythroxylon Coca and *E. novogranatense* are represented by 222 and 2548 plants, respectively, and bear an abundance of seed. The low price of crude cocaine, however, prevents the further extension of these plants.

Jasminum glabriusculum and *Ficus ribes*, the plants which yield the Javanese fever remedy, "gambir utan," have developed well, and dried leaves of both plants have been sent to Germany for examination.

Other Remedial and Poisonous Plants under cultivation in Amani are the following: *Acocanthera abyssinica*; *Aloe ferox*; *Antiaris toxicaria*; *Cassia alata*, *C. fistula*, *C. grandis* and *C. lœvigata*; *Croton tiglium*; *Dracæna Draco*; *Jatropha Curcas*; *Jatorrhiza Columba*; *Marsdenia Condurango*; *Myrsine africana*; *Pilocarpus pinnatifolius* and *P. racemosus*; *Piper angustifolium*; *Psychotria emetica*; *Rhus toxicodendron*; *Sophora tomentosa*; *Strophanthus*; *dichotomus*; *S. gratus* and *S. hispidus*; *Strychnos nux-vomica*; *Syzygium Jambolanum*; *Thephrosia Vogelii*. Fresh seeds of

Cinnamomum camphora (represented by 2139 plants) have again been obtained from Japan and have germinated well. As soon as the weather permits, about 5000 more plants may be set out. The older plants, however, have developed very slowly, particularly during the first years.

Andropogon Schoenanthus and *A. squarrosus*, which yield lemongrass and vetiver oil respectively, are represented in large plantations; while of other volatile oil producing plants, *Acacia Farnesiana*, *Cananga odorata* (Ylang-Ylang) and two varieties of *Melaleuca Leucodendron* (Cajuput) are mentioned. The experiments with

Ricinus have been continued, and particularly with the different varieties of the large-seeded *Ricinus sanzibariensis*, but it appears that profitable cultivation is at best attainable only on the level plains.

Zingiber officinalis is represented by 78 rhizomes received during the year, which have been planted in the Sigi valley and have developed well. Other

Aromatic Plants mentioned are: *Cinnamomum zeylanicum*, *Curcuma longa* and *C. zedoaria*, *Elettaria cardamomum*, *Laurus nobilis*, *Piper officinarum*, *Vanilla planifolia*.

Eucalyptus plants are represented in great variety, most species developing well, but very liable to become wind-broken during the first year of their growth. Of

Gum-Yielding Plants, *Acacia senegal* and *A. leucophæa* are found to grow very slowly, while of

Resin- and Balsam-Yielding Plants cultivation experiments are continued with the following: *Callitris quadrivalvis*, *Liquidambar styraciflua*, *Schleigera trijuga*, *Toluifera balsamum*, *T. pereiræ* and *T. peruifera*.—Pharm. Ztg., li, No. 82 (1906), 908.

Uganda Drugs—Useful Varieties.—M. T. Dawe, the officer in charge of the Forestry and Scientific Department of the Uganda Protectorate, has made a report which gives a vast amount of information of practical value. He has found that the *Funtumia elastica*, which yields excellent rubber, is found in Uganda as well as in West Africa, whence plants had been brought for cultivation in ignorance of this fact. He has also found in abundance a new species, which has been named *Landolphia Dawei*, and yields a first-class rubber, and also *Clitandra orientalis*, another valuable species. *Chlorophora excelsa* is a large tree, the wood of which has the valuable property of not being attacked by the white ants. *Haronga Madagascariensis* yields a kind of gamboge, and another tree, *Symphonia globulifera*, var. *Africana*, yields a tenacious yellow gum resin in color like gamboge. This is doubtless identical with the hog gum of the West Indies, where the typical form of the tree grows, and where the wild hogs rub themselves against the exudation to heal their wounds. Several oil-yielding fruits were met with, one is afforded by a new species of *Carapa*, the oil from which is valued for technical purposes. The tree is abundant, and the seeds can be collected by the ton. The seeds of this genus contain a bitter principle disliked by insects. The Shea butter tree, *Butyrospermum Parkii*, is also abundant. Another tree has a very fragrant wood likened to sandal in odor; it turns out to belong to a new tribe of *Bixaceæ*, which has been named *Daweæ*, and the species *Daweæ Ugandensis*. A large tree of the *Xanthoxylum* genus also yields a fragrant wood. *Kigelia moosa* is used in medicine throughout Uganda for healing wounds. It belongs to the natural order *Bignoniaceæ*, of the physiological properties of which comparatively little is as yet known. The Koussou tree, *Brayera anthelmintica*, is also met with. *Erica arborea*, which yields the wood used for "briar-root" pipes in southern Europe, is abundant on Mount Kichuchu. A kind of Scilla is used in medicine for children's ailments, and appears to be highly valued, as it is often fenced in with reed work or grown as a pot plant and placed on a pedestal. From the roots of *Bau-*

hinia reticulata a mahogany colored pigment is obtained, which is used for staining wooden utensils. *Heteromorpha arborescens* is interesting botanically from being a shrub with edible fruits nearly as large as a black Hamburg grape, but with a large "stone" in the fruit. Near Kibei there are hot sulphur springs which the natives use, and which Mr. Dawe observes renders them strikingly free from skin disease. *Erythrophlaeum Guineense* is valued for its timber, but Mr. Dawe does not indicate that it is used as an ordeal poison in this part of Africa. *Balsamocitrus Dawei* belongs to a new genus, which has large fruits containing seeds embedded in a fragrant balsam. Bees are cultivated by the Acholi people in long cylindrical hives. The bee is referred at the British Museum to *Apis mellifica*, Linn., var. *Adamsoni*, Latr. A new species of acacia, *A. prorsis-pinulosa*, has fragrant flowers like those of *Acacia Farnesiana*. *Acacia Seyal*, abundant in the Madi Bari countries, has also fragrant blossoms.—Pharm. Journ., Aug. 4, 1906, 147.

Official Drugs—Ash Determinations.—In their Fall Report (1906), Cæsar & Loretz direct attention to the probable necessity of correction in the ash determinations adopted in the recently received pharmacopœias, and particularly in the Pharm. Austr., viii, in which, out of a total of 171 vegetable drugs, such determinations are required in 147. Owing to the variations in the weather and conditions of soil, and the consequent influence on the mineral content of plants, corresponding variations in the ash content must be expected, and average numbers can only be definitely accepted after numerous confirmatory experiments have been made. In the case of powdered drugs, the extent of variation in ash introduced by attrition, in the form of iron or stone-particles from the mills, must also be taken into consideration. The relation of ash content to the drug, whether based on the latter in an air-dry or absolutely dry condition, should also be defined.—Pharm. Ztg., li, No. 75 (1906), 830.

Adulterated Drugs—Analyses of Various Samples by the Public Analyst of Birmingham, England.—J. F. Liverseege gives a resume of the analyses of adulterated drugs and preparations, purchased for examination during some years, not only from qualified Birmingham chemists, but also from drug companies, herbalists and hucksters. It is not practicable to include the results of these examinations in this report, but the paper is interesting as showing in some cases a lamentable failure to supply drugs and preparations of official quality to the English public, and it is of further interest to be informed that the worst of the samples have been obtained from the shops kept by unqualified persons. The practical value of the paper consists in the particulars of the analytical methods employed in the examination of the more important drugs, which may be profitably consulted in the Yearbook of Pharmacy, 1906, 265-278.

In contrast to the preceding observation it is of interest to learn from

a paper by J. E. Brunker that the medicines supplied for the treatment of the sick poor in Ireland are uniformly of good quality. He reports that out of 9,455 samples of drugs examined during the year by the Union analysts, only 231 were rejected, and that most of the rejected drugs were defective only in a slight degree. As shown by the table accompanying this paper, of a total of 2,665 tinctures 69 were defective; of 302 liquores, 16, and of 376 liquid extracts, only 23.—*Trans. Brit. Pharm. Conf. (Year-book of Pharm.)*, 1906, 292-294.

Drugs and Chemicals—Commercial Analyses.—Willard Graham communicates the results of examination and analysis of a large number of drugs and chemicals, which can be referred to here only by their titles, but may be profitably consulted in the original by those interested: Acetone; acid. benzoic, Germ.; acid. phosphoric, syrupy; antimony and potassium tartrate; asafoetida; belladonna, leaves and root; cochineal; cresol, U. S. P., 1900; ether; guaiacol; oil of camphor; white camphor oil; black camphor oil; oil of citronella; oil of cloves; oil of coriander; oil of lavender flowers; oil of lemon; oil of sandalwood; mace; opium; gum; potassium iodide; resorcinol; soap, castile.—*Proc. Penna. Pharm. Assoc.*, 1906, 152-156.

Vegetable Drugs—Objection to Drawers as Containers.—W. C. Alpers is unable to see why any pharmacist should keep vegetable drugs in drawers. It has been his experience that bugs go from one drawer to another, and in time ruin the whole stock of crude drugs. The loss is very great, and there is no earthly reason why it should be suffered. Dr. Alpers keeps all of his vegetable drugs in bottles, and visitors to his store will see two rows of these wide-mouthed containers all along on top of his wall-case fixtures. They are incidentally an ornament to the store, and as such far preferable to the patent-medicine advertisements usually seen there.—*Bull. Pharm.*, Aug., 1906, 346.

Vegetable Drugs—Determination of Extract.—According to the new Austrian Pharmacopœia the content of extract in vegetable drugs is determined by macerating with frequent agitation 10 Gm. of the drug, powdered as fine as possible, in 100 Gm. of boiling water, or 100 Cc. of alcohol, for 24 hours, and evaporating 50 Cc. of the filtrate to constant weight. O. Frey, however, finds that in some cases, the filtration is very tedious, often requiring 8 hours to obtain the necessary quantity of filtrate, and mentions a large number of drugs in which the results may be vitiated from this cause. He therefore proposes that the quantity of drug be reduced to 5 Gm. for the prescribed quantity of solvent, which assures rapid filtration and consequently more reliable comparative data.—*Pharm. Ztg.*, lii, (1907), No. 28, 290; from *Pharm. Post*, 1907, No. 12.

Powdered Drugs—Analytical Scheme for their Microscopic Examination.—Burt E. Nelson's series of papers on an analytical scheme for the

microscopical examination of powdered drugs, begun in Merck's Report of July, 1900 (see Proceedings, 1901, *et seq.*) and continued in monthly installments with more or less regularity since then, is continued in the same journal during the past year, the microscopical features of the following drugs being described and illustrated by numerous drawings since the date of the last report :

Miscellaneous Cellular Powders: Piper nigrum, Pimenta, Illicium, Caryophyllus, Rhus glabra, Colocynthis, Coriandrum, Capsicum, Cardamomum, Vanilla, Conium, Chenopodium, Scilla, Humulus, Althæa, Ulmus, Kamala, Lupulin, Lycopodium, Ergota, in the August number, 1906, 224. *Piper nigrum, Cubeba, Pimenta, Illicium*, in the November number, 1906, 321-322. *Rhus glabra, Galla, Anisum, Carum, Foeniculum*, in the February number, 1907, 38-39. *Coriandrum, Capsicum, Cardamomum*, in the May number, 1907, 130-131. *Macis, Conium, Vanilla, Chenopodium, Colocynthis, Scilla, Kamala, Lupulinum, Lycopodium, Ergota*, in the June number, 1907, 161-163.

Fiber.—Determination in Drugs.—H. W. Jones expresses the opinion that in the examination of drugs more attention should be paid to the amount of fiber present. He prefers to supplement the ordinary microscopic examination by a further examination of the residues left after treatment with acid and alkali as generally used for the determination of fiber. By this means the bulk of the powder is so diminished that small percentages of foreign bodies, as ground olive stones, are clearly observable. For the purpose of "concentrating" a powder the author recommends a modification of the acid and alkali method, which he designates the

Ammonia Method.—Treat 1 gram of the powder in a porcelain dish with 20 Cc. of water and boil for three minutes, preferably on an iron plate. Add 50 Cc. of 10 per cent. sulphuric acid, and continue boiling for one minute. Place on the water bath and treat for two hours, adding water to replace that lost by evaporation. The aperture of the water-bath should be of a sufficient size so that the whole contents of the dish are kept fully heated. Collect the insoluble residue on dried and tared acid-washed filter paper, free from ash. Remove all traces of acid by washing with water. Drain, and cover the funnel with a watch glass, using several portions of strong liquid ammonia (0.880) until the filtrate appears colorless. This part of the process should not be hurried. Treat with alcohol (90 per cent) to remove a further amount of soluble matter, and wash with more of the spirit. Use ether for the final washing; dry at 100° C. Cool and weigh in a closed tube.—Trans. Brit. Pharm. Conf. (Year Book of Pharmacy), 1906, 290-291.

Herb Names—Unwritten Dialect applied in Guernsey.—E. D. Marquand gives an interesting account of the plant names as used in the Guernsey dialect. The unwritten dialect in use in the Channel Islands is considered.

older than classical French. Probably it is a survival of the language which was introduced into England at the time of the Norman Conquest. Some of the herb names are interesting for their difference from the names now in use, such as Bringe for *Cystisus scoparius*, Camière for chamomile, Chue for hemlock, this name being still used in Normandy, Claquet for digitalis, Epergoutte for *Matricaria parthenium*, Han for *Cyperus longus*, and Hôloges (horologes, clocks) for *Taraxacum officinale*. The name *Iâne* applied to wormwood is in Normandy *liane*, and further south *licne* and *alienne* are variants of *aluine* or *alvine*, the old French name for wormwood; other names worth mentioning are Querpentière for *Achilea millefolium* and Yerre for ivy. The old French name for the plant is *hierre*. and the modern French *lierre* is formed by the addition of the definite article *Le*. The uses to which some of the herbs are put differ to a certain extent from the use of the same plants in England. Thus tormentil is valued as a remedy for quinsy and is called Esquinancée; *Sedum reflexum*, mixed with garden thyme, is used in the form of *tisane* for diabetes; *Scrophularia nodosa* for cramp, whence its Guernsey name "herbe de crampe;" *Centaurea nigra* is called "herbe de flor," because it is used as a remedy for "flor," or indurated udder in cows after calving, a decoction of the plant being used as a fomentation; *Polygala vulgaris*, as well as *Potentilla tormentilla* are used for warding off or curing paralysis; *Scrophularia aquatica* (Orvale) is used for drawing and healing boils, etc. *Parietaria officinalis* "Palitole" is employed in the form of *tisane* for diabetes; *Leonurus cardiaca* "Picot," is considered an excellent medicine for pigs, the juice of the leaves pounded up with some scales of the houseleek (*Sempervivum tectorum*) being given, and milk added to induce the animal to drink it; *Mentha pulegium*, Pouliet or Poue-ye, is used for destroying vermin in children's hair, these parasites being called pouâs; *Æthusa cynapium* is called 'Tuelapin, *i. e.*, kill-rabbit, and is evidently considered to be poisonous in Guernsey.—Pharm. Journ., July 28, 1906, 106; from Trans. Guernsey Soc. Nat. Hist.

Herbaria—Plants which in Drying Stain the Paper.—J. H. Maiden calls attention to the stains produced by some plants on the herbarium paper to which they are attached, these stains in some cases penetrating a dozen sheets or more, and leaving in many cases sharp photographic impressions on the paper. Most of the stains appear to be purplish, of varying intensity; the remainder are mostly grays and browns. These phenomena arise from an emanation, possibly a dry distillation. It is an open question to what extent, if any, the use of preservatives, such as naphthalene, may be responsible. The character of stain produced by plants belonging to some sixteen or more natural orders are described.—Amer. Journ. Pharm., Febr., 1907, 62-67; from Jour. and Proc. Roy. Soc. N. S. Wales, xl, (1906), 39-45.

"*Insipio Mil Nombre*"—*A New Drug from Argentina*.—C. R. Marshall and J. H. Wigner have subjected a small sample of a drug termed "*Insipio Mil Nombre*," which was submitted to the Therapeutic Committee of the British Medical Association, to proximate examination. The drug, which is described pharmacognostically, consists of the tendrils of an, as yet, unidentified creeper, and is used by the natives of Argentina, according to fleet Surgeon E. S. Miller, R. N., in the form of a decoction for various gastric derangements. The bark (50 Gm.) was found to contain 0.82 per cent. of a volatile oil, having a slight not unpleasant (yeast-like?) smell; 0.064 per cent. of a brownish bitter resin; 1.64 per cent. of extractive matter (yielded to 70 per cent. alcohol, and 4.3 per cent. of sugar, probably a mixture of dextrose and levulose. The woody portion (60 Gm.) yielded also volatile oil, but less in quantity, some bitter resin (not weighed) 1.17 per cent. of extractive matter, and 3.85 per cent. of sugar. While the quantities of active substances were too small to permit effective pharmacological investigation, there is little reason to believe that the drug possesses properties other than those of an aromatic bitter. —Pharm. Journ., Aug. 4, 1906, 144.

Ishwarg—*A New Drug from India*.—David Hooper calls attention to the leaves of a small tree,

Rhazya stricta, growing in Baluchistan, Afghanistan and Arabia, which are used in medicine in India, especially in the Punjab and Sind. The plant is called *Ishwarg*, and the leaves are taken as a bitter tonic for fevers and general debility. By some travelers it has been reported as poisonous. The leaves have been sent during the year from Baluchistan, where they are given in infant diseases, for bites of snakes, and for tooth and eye diseases. The leaves contain a large quantity of alkaloids, one of which is volatile, and has the odor of coniine, the alkaloid of hemlock. The non-volatile alkaloid resembled in some particulars one of the bases of aspidiosperma. It dissolved in sulphuric acid with a red color, changing to purple, and contained 8.01 per cent. of nitrogen. The alkaloids are being tested by Dr. McCay, the Professor of Physiology at the Medical College, Calcutta.—Pharm. Journ., Sept. 1, 1906, 259.

A. VEGETABLE DRUGS.

ALGÆ.

Agar-Agar—*Species of Algæ Used for its Preparation in Japan*.—E. M. Holmes, in an article on "The Japanese Seaweed Industry," gives an interesting account of the method of preparation of agar-agar or Japanese isinglass, hitherto very imperfectly known, which is abstracted from an account prepared by Mr. C. J. Davidson, of the British Embassy at Tokyo. From this it appears that the word used in Japan for this product is

"Kanten," meaning "cold sky," and is probably due to the fact that it

can only be prepared where the air is cold and dry. The chief seat of the manufacture are the prefectures of Osaka, Kioto, Magano and Hiogo, the manufacture being carried on mainly during the winter months, although seaweed is collected from May to August, when it is most abundant and in best condition. It appears, also, that according to the species of seaweed employed, the "kanten" varies in quality, and since some confusion exists in the article of Mr. Davidson concerning these, it is the principal object of Mr. Holmes in the present paper to throw some further light on the subject by a description of the seaweeds that are mentioned or may be used for preparing this product. The author gives a description, accompanied by illustrations, of eleven species of seaweeds, which must be consulted in the original, and it must suffice here to say that only five species, all belonging to the genus *Gelidium*, are used in the manufacture of "kanten," which varies in quality according to the species employed: the one chiefly used and the most important ingredient in Japanese isinglass being *Gelidium Amansii*, locally called "Tengusa;" the one yielding the very best "kanten," being a species similar to "Tengusa;" a third species, called "Higekusa," and a fourth, *Gelidium Japonicum*, called "Onigusa," also yielding a good "kanten;" while the fifth species, *Gelidium subcostatum*, known as "Hirakusa," is used for making an inferior kind of "kanten."

"Kanten" occurs in the form of square bars and in bundles of slender strips. Mr. Holmes is informed that the square sticks are chiefly used for making food products, such as jellies and sweetmeats, the slender strips for household work, as we use starch for stiffening purposes. For dressing textiles and paper, a seaweed glue recently described under the name of "Funori," is used, particularly for the material employed in the construction of Japanese umbrellas and Chinese lanterns. The greater bulk of the Japanese isinglass or "kanten" goes to China and Hong Kong, only a very small portion finding its way direct to the European market.—Pharm. Jour., Sept. 22, 1906, 319-323.

Funori—A Japanese Seaweed Glue.—E. M. Holmes gives some information and corrects some errors concerning the botanical source of the material described in Mr. Davidson's report (see "Agar-Agar") for the preparation of the Japanese seaweed glue, called "Funori." The word nori is used in Japan for seaweed generally, and the term funori more especially for those which yield a mucilage, or can be used in the same manner as size is used in this country. The term glue as applied to the funori product is somewhat of a misnomer, as it is not used like glue, but for imparting a gloss to textiles and silk, and as starch for stiffening linen, whilst other commercial varieties are employed in decorating china and for plastering walls. Several species of seaweed are used in different districts for the manufacture of funori, but the best qualities are obtained from the Yanago funori (*Gloiopeltis tenax*) and ordinary funori (*Gloi-*

peltis coliformis), illustrations of which are given, while other species, some of them tough, with larger fronds, are also used, the method of preparing the funori depending upon the character of the species used. If slender and soft like *Gloiopeltis*, the alga is spread out on the ground in a layer, sprinkled with fresh water, and kneaded with the hands and feet. It is then placed in baskets, thoroughly washed by immersion in water, and spread out evenly in thin layers on straw, rush mats, or in shallow trays, to bleach and dry. At first it is sprinkled about every ten minutes to prevent it curling, but when the process has reached a stage at which a sticky juice begins to exude from the seaweed, it is no longer sprinkled. It is left untouched over night, after which the bleaching is complete. The finished funori is in the form of loose sheets, consisting of seaweed adhering together in a kind of net-work, and is supplied in bundles of sheets varying in size—from 10 x 14 inches to 2½ x 4½ feet—the latter size usually in rolls. For use it is immersed in boiling water, in which it readily dissolves. Mr. Holmes calls attention to some printer's errors in the names of the species mentioned in Mr. Davidson's report as contributing to the source of funori. Furthermore, that this so-called "seaweed glue" might possibly prove a desirable substitute for the "animal glue" ordinarily used as size.—Pharm. Journ., Sept. 29, 1906, 347-348.

Alsidium Helminthocorton.—*Proximate Examination*.—Garcain has subjected *Alsidium helminthocorton* (Corsican moss), formerly used as a taenifuge, to proximate examination. He finds its activity due to a resin, which is readily soluble in alcohol, ether and chloroform, but insoluble in petroleum benzin, and difficultly soluble in water. Other constituents are an oil and a gelatinous mass containing pentose-like bodies. The infusion or a syrup are recommended as being active pharmaceutical preparations.—Pharm. Ztg., li, No. 68 (1906), 758; from Jour. de Pharm. et Chim., Aug., 1906.

BACILLARIÆ.

Bacillus Lacticus, B..—*Preparation and Properties of a Bouillon Culture*.—Lematte has succeeded in cultivating, in a specially prepared bouillon, the *Bacillus lacticus, B.*, which in 1903 Cohendy isolated from a sample of curdled milk. Lematte recommends the use of this liquid culture in some cases of diarrhœa, since Bienstock's experiments show that the bacillus of putrefaction of the intestinal contents cannot develop in the presence of a vigorous *Bacillus lacticus*. The bouillon is made of lactosed and mineralized malt, and the resulting product is a brownish-colored liquid, smelling of malt, and with a slightly acid taste. To obtain the best results the author advises that the patient drink, one hour before meal time, a Madeiraglassful of this bouillon. The diet should be poor in nitrogenous materials and rich in sugars. It is stated that milk curdled by the bouillon of *B. lacticus, B.*, though similar in appearance to that

curdled by rennet or acid, differs from it in possessing curative properties. —Pharm. Journ., Nov. 17, 1906, 541; from Brit. Med. Journ. (Epid.), Oct. 8, 1906, 48.

Lactic Acid Bacteria—Vitality.—Carl Wehmer found that technical lactic acid bacteria kept for six years on dry calcium lactate were still able to set up the lactic fermentation of sugar, but after keeping in the same way for ten years they had lost all their activity. A rough calculation showed that the bacteria are able to produce about ten times their own weight of lactic acid, but the yield, which does not as a rule exceed 60 to 70 per cent., is considerably influenced by the purity of the culture. The wastage of sugar has not been accounted for.—Pharm. Journ., Jan. 12, 1907, 27; from Chem. Ztg., 1906, 30, 1033.

FUNGI.

Moulds—Composition of Japanese and Chinese Cultures.—A. M. Osendowski has prepared by the method of Hoppe-Seyler the pure enzymes from the mould cultures of Japanese and Chinese commerce, and subjected them to analysis with the results given below. The Japanese cultures, which are supplied in the form of a turbid, sticky fluid, are obtained from

Aspergillus oryzae, a fungus which has from time immemorial been used for the preparation of the rice-brandy known as "Sake." The enzyme, separated and purified by the method mentioned, is readily soluble in glycerin, but loses its hydrolytic power in such solution after several hours. In the dry state it forms a yellow amorphous powder. Its fermentative action is, however, destroyed when heated to 70° C., and also when the culture-medium is treated with heavy metals, arsenites and arsenates, and particularly by alkalies, even when the latter are present to the amount of 0.08 per cent. It, however, shows greater resistance to the influence of antiseptic compounds, such as phenol, resorcin, salicylic acid. The analysis of two samples of the enzyme, purified by repeated precipitations and dialysis, gave the following numbers: C, 50.81 and 53.11; H, 6.02 and 5.84; N, 16.18 and 16.38; S, 2.03 and 1.29; O, 21.89 and 20.61; ash, 3.07 and 2.77. Experiments made with the cultures on the starches of maize, wheat and potatoes gave satisfactory results, but were most satisfactory in the case of rice. It suffices to add the cultures to the swelled rice grains, heated to 32°–35° C., to ensure perfect saccharification with ease and rapidity, and without complicated manipulation. The Chinese cultures which are supplied in form of a brown liquid, are obtained from

Mucor Rouxii, and similarly to the Japanese cultures, are used for preparing an arrak-like beverage from rice. The general properties of the enzyme separated from these cultures are similar to those of the *Aspergillus oryzae* enzyme, but it is white in the dry state, and its action on starch is

slower. The analysis of two specimens of the purified enzyme gave the following figures: C, 48.12 and 46.89; H, 5.74 and 6.10; N, 10.60 and 7.88; S, 1.20 and 0.94; O, 29.73 and 34.95; ash, 4.55 and 3.26.—Pharm. Ztg., lii (1907, No. 17, 169; from Journ. der. russ. phys.-chem. Ges., 1906, 1070.

Moulds—Action of their Ferments on Cinnamic Acid.—Oliviers finds that the ferments formed in cultures of *Aspergillus niger* and *Penicillium glaucum* rapidly reduce cinnamic acid to cinnamene, which may be recognized by its peculiar odor resembling that of coal gas. If a culture of aspergillus be agitated so as to bruise the mycelium, and then filtered through a Chamberland filter, the liquid at once liberates cinnamene from a solution of sodium cinnamate. So delicate is the reaction that it is suggested that cinnamic acid may be employed as a means of detecting moulds in foods and pharmaceutical preparations. The well-known gas-like taste and smell which is not unfrequently complained of in syrup of tolu balsam is due to the presence of these moulds in the syrup. No similar decomposition of an aromatic acid into its corresponding hydrocarbon by an enzyme has been recorded hitherto.—Pharm. Journ., Aug. 4, 1906, 147; from Journ. de Pharm. et. Chim., 1906, 24, 62.

Ergot—Abnormal Characters of a Russian Sample.—G. Weigel calls attention to a large consignment of abnormal Russian ergot recently observed on the Hamburg market. It had a remarkably black color which extended in many instances also into the interior of the sclerotium, and the average length of the sclerotia was only 0.5 to 1 Cm., in rare instances up to about 1.5 Cm., whereas most authorities give a length of 1 to 3 or 2 to 4 Cm. The drug was rejected in many cases with the remark that it is apparently not derived from rye or wheat, but probably from another Graminaceae; but this does not preclude the possibility that it is old ergot rejected in the process of garbling and rejuvenated by means of sulphurous acid.—Pharm. Centralh. xlvii, No. 45 (1906), 864.

Abnormal Ergots—Varieties found in the Commercial Drug.—Supplementing the above description of abnormal Russian ergot, which he regards as being simply large accumulations of siftings and garblings from ordinary ergot, damaged by moisture and exposure, and subsequently dried at a high temperature, A. John calls attention to the fact that quite a variety of abnormal sclerotia may be found on garbling the commercial drug. Such abnormal forms are shown in a plate illustration accompanying the original paper, while another abnormal kind, the so-called "albinos," retains the form and size of normal ergot, but is characterized by the absence of the violet coloring matter in the external layer, giving these sclerotia a pale-yellow appearance. Abnormally large rye sclerotia are shown, the largest being 5 Cm. long, while the thickest, fissured, and strongly curved specimen has a diameter of 1 Cm. A markedly short

and thick *scelerotium of wheat* is shown, which is occasionally offered direct from Russia. This has a uniformly oval-round form, with a length of 1.5 Cm. and thickness of 0.5 Cm. The sclerotia of a widely distributed forest grass, *Molinia cærulea* Much. is also exhibited in the plate illustration. This is remarkable for its small size, (8 Mm. in length by 2 Mm. in thickness) when compared with the large size of the grass upon which it is produced, which grows to a height of 1.5 meters.—Pharm. Centralh., xlvii, (1906) No. 46, 943.

Ergot—Constituents—According to the recent studies and experiments of Dr. F. Kraft, which are given in detail, ergot of rye contains the following specific bodies: *Ergosterin* of Tanret; two alkaloids: the crystallized *Ergotinine* of Tanret, and the amorphous *Hydroergotinine*; a group of lactone acids: the *Secalonic acid* and its amorphous kindreds; *Secaleamidosulfonic acid*, not related to secalonic acid; together with the other established bodies: *Betaine*, *Choline* and *Mannite*. The alkaloids are not concerned in the specific uterine contractions, but are the toxins responsible for the spasms and gangrene produced by the drug. Keller's *Cornutine* and Jacobi's *Secaline* are identical with ergotinine; *ergotinic acid* is related to secaleamidosulfonic acid.—Arch. d. Pharm., 244, No. 5 (1906), 336-359.

Ergot—Valuation and Identification of its Preparations.—A. Fernau proposes a method for the identification and valuation of ergot preparations, which depends upon the magnificent violet-red color produced by alkaline bicarbonates in the presence of undecomposed sclererythrin. A small quantity of ergotin or extract is dissolved in 5 Cc. of water, 10 drops of diluted sulphuric acid added, and the mixture shaken out with 20 Cc. of ether. If this ether solution is then shaken with 15 drops of a cold saturated solution of the bicarbonate, the latter extracts the sclererythrin and forms an aqueous layer of a splendid violet-red color if the sclererythrin has not suffered decomposition during the preparation of the extract, but if it has suffered partial decomposition the color fails to come out bright, and thus affords a criterion of the care exercised in its preparation.—Pharm. Ztg., lii (1907), No. 19, 192; from Pharm. Post, 1907, No. 7.

LICHENES.

Cetraria Islandica and *C. Nivalis*—*Proximate Constituents and Nutrient Value*—R. Hansteen directs attention to the food value of *Cetraria islandica* Ach. and *Cetraria nivalis* Ach., two northern lichens which become very palatable after the complete removal of their bitter constituents, cetraric and usnic acids. He finds that

Cetraria Islandica contains up to 3 per cent. of the very bitter cetraric acid, the removal of which leaves a very digestible food product containing 2.81 per cent. of nitrogenous substance, 0.40 per cent. of fat, 4.6 per

cent. cellulose, 79.2 per cent. of lichenin (lichen-starch) and closely related non-nitrogenous substances, 6.99 per cent. of inorganic matter (ash), and 6 per cent. of water.

Cetraria Nivalis contains besides *usnic acid*, which is strongly lævo-gyrate (quantity not stated), 2.35 per cent. of nitrogenous matter, 3.99 per cent. of fat, 2.07 per cent. cellulose, 90.2 per cent. of non-nitrogenous matter, and 1.39 per cent. of ash (calculated on dry substance), and furnishes after complete removal of the acid, a whitish meal well adapted for bread or pastry.—Pharm. Ztg., li, No. 90 (1906), 998; from Chem. C.—Bl., ii, No. 10, 1906.

AROIDEACEÆ.

Japanese Calamus Root—Morphologic and Chemical Examination.—Y. Asahina has studied the characteristic elements of Japanese calamus root, with results which lead him to regard the Japanese plant to be morphologically identical with the European *Acorus calamus* L. The coarsely-sliced root yielded to steam distillation about 3 per cent. of a yellowish, disagreeably odorous and bitter volatile oil, of sp. gr. 0.976 at 15° C., and b. p. 240°–320° C. He finds, furthermore, that

Japanese Calamus Oil does not contain a terpene $C_{10}H_{16}$, but he infers the existence of a sesquiterpene from the fact that the principal fraction of the oil, which yielded veratric acid by oxidation, possessed powerful optical activity, gave a green coloration on addition of acetic acid and sulphuric acid, and was markedly richer in carbon than *methyl-eugenol*—the latter being the only constituent of the oil which he has positively identified.—Pharm. Ztg., li, No. 90 (1906), 998; from Jour. of Pharm. Soc. of Japan, 1906, No. 295.

GRAMINACEÆ.

Bamboo Leaves—Uniformity of Structure.—Sir D. Brandis states that while the leaves of other grasses exhibit a great variety of structure, those of bamboos are exceedingly uniform. In bud they are always convolute; they all have in the upper epidermis, alternating with the longitudinal nerves, bands of large bulliform cells known as motor-cells. In most species these motor-cells are filled, entirely or partially, with solid bodies of silica. Between the bands of bulliform cells and the longitudinal nerves bamboos (with one exception as far as known, the leaves of *Chusquea pinifolia* of South-east Brazil) have large apparent cavities, which are completely filled by large, flat, thin-walled cells, lying one over the other like the leaves of a book. This tissue is entirely different from that which, in a young state, fills the cavities in the leaves of *Glyceria aquatica*, *G. Fluitans*, and other aquatic grasses. The species placed by Dr. Stapf in "Flora Capensis" in the new tribe *Pharæe* have, as far as known, leaves with a structure similar to bamboo.—Pharm. Journ., Nov. 17, 1906, 543; from Proc. Linn. Soc. Nov., 1906.

Bambusa Arundinacea.—The principle source of *Tabaschir*, which see under "Silicon."

Gass-tenga.—An *East-Indian Food-Product*.—According to David Hooper, an acid food-product, known as "Gass tenga," is prepared in Upper Assam, where it is eaten with rice, from the young shoots of a bamboo,

Dendrocalamus Hamiltonii the process, as given by Dr. Mann, of the Indian Tea Association, being one of fermentation, and afterwards drying in the sun. The acid principle is in colorless crystals, and is similar to aspartic acid. Three different samples of gass-tenga afforded 2.3, 4.5, and 1.1 per cent. of this organic acid, the difference probably being due to the time consumed in the fermentation or to some modification of the process. The acid appears to be derived from the asparagin of the growing shoots of the bamboo.—Pharm. Journ., Sept. 1, 1906, 259.

Oil Grasses.—*Systematic Study and Change in Nomenclature*.—In their Semi-Annual Report of April, 1907, Schimmel & Co. devote considerable space (pp. 30–36) to a work by Dr. Otto Stapf, entitled, "The Oil-Grasses of India and Ceylon," which has recently been published in the "Bulletin of Miscellaneous Information, Royal Botanic Gardens, Kew," (1906, No. 8, 297). Having repeatedly in previous reports alluded to the difficulties which exist in an exact differentiation of the individual *Andropogon* or oil-grasses, which appear almost insuperable in view of the many varieties and transition forms, Schimmel & Co. observe that these difficulties have come to the front particularly in recent times, when the oils obtained from these grasses meet with an increasing amount of interest, and when frequent trials are made to cultivate the grasses supplying the individual oils, both in their own habitat and especially in other tropical countries. In view of the deficient knowledge of the individual grasses such cultivation-trials have led to frequent disappointments, inasmuch as apparently identical plants yielded totally different oils. Although the observations and conclusions of the very comprehensive and thorough study of the individual grasses now communicated by Dr. Stapf cannot lay claim to absolute completeness, yet what has been so far attained clears up many questions which had hitherto remained unanswered, and it may be taken for granted that the uncertainty which has prevailed on this subject will soon disappear completely, since the impulse given by Stapf will doubtless induce many others to take up of the study of the oil-grasses. Furthermore, the elucidation of this question will probably be greatly assisted by the fact that Stapf has completely broken with the present nomenclature which has largely contributed to the existing confusion, and has classified the individual grasses in the following groups or genera: *Cymbopogon* with 10 species; *Vetiveria* with 1 species, *Andropogon* with 1 species.

In the detailed discussion of the individual species the author enters in

detail into the history, the habitat, the botanical characteristics, the synonyms and vernacular names of the various grasses, and supplies details concerning the oils derived from them. It must serve here to simply mention the titles, synonyms and vernacular names of these oil-grasses, as follows :

1. *Cymbopogon Schoenanthus* Spreng. (synonyms : *Andropogon Schoenanthus* L., *A. laniger* Desf., *A. Iwarancusa* subsp. *laniger* Hook. f.), "Camel grass."

2. *Cymbopogon Iwarancusa* Schult. (synonym : *Andropogon Iwarancusa* Jones), "Terankus" (= fever remedy).

3. *Cymbopogon Nardus* Rendle (synonym : *Andropogon Nardus* L.), "Citronella grass." [The mother plant of citronella grass, which is cultivated in two varieties, "Maha pengiri" (old citronella grass or Winter's grass) and "Lenabatu" (new citronella grass), is probably the wild "mana grass" (*Cymbopogon confertiflorus* Stapf) found in Ceylon. Morphological differences between these two varieties do not exist.]

4. *Cymbopogon confertiflorus* Stapf (synonyms : *Andropogon confertiflorus* Steud., *A. nilagiricus* Hochst., *A. nardus* var. *nilagiricus* Hack.), "Mana," "Bambe."

5. *Cymbopogon flexuosus* Stapf (synonyms : *Andropogon flexuosus* Nees ex Steud., *A. nardus* var. *flexuosus* Hack.), "Malabar or Cochin grass."

6. *Cymbopogon coloratus* Stapf (synonyms : *Andropogon coloratus* Nees, *A. nardus* var. *coloratus* Hook. f.) belongs to the "lemon grasses."

7. *Cymbopogon citratus* Stapf (synonyms : *Andropogon citratus* D. C., *A. Schoenanthus* L., *A. citriodorum* Desf., *A. Roxburghii* Nees, *A. ceriferus* Hack., *A. Nardus* var. *ceriferus* Hack., *Schoenanthum amboinicum* Rumph.), "Lemon grass," "Sereh" (Malay).

8. *Cymbopogon Martini* Stapf (synonyms : *C. Martinianus* Schult., *Andropogon Martini* Roxb., *A. pachnodes* Trin., *A. Calamus aromaticus* Royle, *A. nardoides*, a, Nees, *A. Schoenanthus* Flück. et Hanb., non L., *A. Schoenanthus* var. *genuinus* Hack., *A. Schoenanthus* var. *Martini* Hook. f.), "Rusa grass," "Geranium grass."

9. *Cymbopogon caesius* Stapf (synonyms : *Andropogon caesius*, a et β Nees, *A. Schoenanthus* var. *caesius* Hack.), "Kamakshi grass."

10. *Cymbopogon polyneuros* Stapf (synonyms : *Andropogon polyneuros* Steud., *A. versicolor* Nees, *A. Schœnanthus* var. *versicolor* Hack., *A. nardoides* β minor Nees ex Steud.), "Delft grass."

11. *Vetiveria zizanioides* Stapf (synonyms : *Andropogon muricatus* Retz., *A. squarrosus* Hack., *Vetiveria muricata* Griseb. a. o.), "Vetiver grass," Anglo-Indian "Khas khas," meaning "aromatic root."

12. *Andropogon odoratus* Lisb., a grass discovered by Dymock in Thana in 1875.

While Schimmel & Co.'s review of Dr. Stapf's work gives much interesting information, the original work above cited must be referred to with regard to the very voluminous historical part and the botanical details.

The Oil Grasses of India and Ceylon also furnish the subject of an interesting review by E. M. Holmes of the progress that has been made in the identification of the plants yielding the fragrant East Indian oils known by the general term of "grass oils." This paper, which can not be conveniently condensed, is of particular interest in connection with Dr. Stapf's recent investigations referred to in the preceding abstract, and may be consulted in *Pharm. Journ.*, Jan. 26, 1907, 79-80.

PALMACEÆ.

Carnauba Wax—New Determination of Constants.—In view of considerable disagreement in the constants of carnauba wax recorded by different chemists, L. G. Radcliff has undertaken a series of experiments with the object of determining the constants on one and the same sample of a genuine wax by various methods, which are described in some detail. The results have led him to record the following figures as correctly representing the constants of genuine carnauba wax, obtained by the usual method from the leaves of *Copernicia cerifera*: Melting point (in capillary tube), 84° C.; acid value, 2.9; saponification value, 88.3; ether value, 85.4; iodine value, 13.17.—*Pharm. Journ.*, Dec. 1, 1906, 596.

ASPARAGINEACEÆ.

Smilacina Racemosa and S. Bifolia—Proximate Constituents of their Fruits.—C. G. Eldredge and L. M. Liddle report the results of the proximate examination of the fruits of two species of *Smilacina*, viz., *Smilacina racemosa* and *Smilacina bifolia*. Both kinds of fruit were gathered at Sylvan Beach, on the shores of Oneida Lake, New York. The fruit of *S. racemosa* consists of berries which are borne on a racemose panicle. Most of them were gathered on August 6th while still green, because it was noticed that as they ripened the birds and fowls ate them, and many fell upon the ground and were lost. When first gathered they were spherical in shape, green in color with reddish stripes, somewhat of a pearly luster, and about as large as medium size peas. They were picked attached to the upper portion of the stalk, and allowed to ripen slowly in the house. When ripened in this way, or allowed to mature naturally, they possess a bright red appearance, and resemble currants. If the berries are kept for two or three hours in the air-bath at 110-120° C. they assume the red appearance, and resemble the fruit that has come to its natural maturity. Three months after gathering, the berries weighed one-fifteenth of a Gm. each, while those that had been secured the year before, after fifteen months, weighed one-twentieth of a Gm. Each berry contains a relatively large nutlet of oily or resinous appearance. While this species

is in general widely distributed, at Sylvan Beach the plants are restricted to a narrow area. The berries of *S. bifolia*, which were gathered from the 10th to 30th of September, 1906, are much smaller than those of *S. racemosa*, averaging one-twenty-eighth of a Gm. in weight. The nutlets were equal in hardness and toughness to the *racemosa*, and yielded only to the persistent use of the ore crusher. The same acids, bases and oils were found in this as in the other species. The following substances were found in the two fruits:

Acid potassium tartrate, acid potassium oxalate, tannic acid in the ripened fruit of both species.

A small amount of calcium oxalate in the husks. Fructose, with possibly a little glucose, in the husks and the fleshy part of the berries. Pure fructose in the nutlets. Olein and palmitin.

A small amount of gum in both species.

The berries of both species seem to possess the same general properties.—Chem. News, April 19, 1907, 182-183.

LILIACEÆ.

Jafferabad and Uganda Aloes—Percentage and Kind of Aloin Characterizing Them.—Having obtained authentic specimens of Jafferabad aloes from Prof. H. G. Greenish, Messrs. Hearon, Squire and Francis, and from the Pharmaceutical Society's Museum through Mr. E. M. Holmes, E. Léger has found that it contains 13.6 per cent. of aloin when extracted with a mixture of 1 volume of methylic alcohol and 5.5 volumes of chloroform, purifying the product by recrystallizing from a mixture of 1 volume of methylic alcohol and 2 volumes of chloroform. Under like conditions, Cape aloes yields only 5 or 6 per cent. of aloin. This aloin, when treated with hydrochloric acid and potassium chlorate, gives a chloro-derivative crystallizing in flat tubular clinorhombic crystals. This body, when heated in a sealed tube with acetyl chloride, gives an acetyl-derivative, melting-point, 163.2° C. (corr.). Chlorobarbaloin, when acetylated, gives a compound, melting-point, 162.6 C. (corr.). The aloin of Jafferabad aloes is, therefore, presumably barbaloin. It contains no isobarbaloin. Tschirch and Hoffbauer state that the aloin of Jafferabad aloes has the melting-point 152° C., while barbaloin melts at 147°. But the author does not attach much importance to the melting-point of aloins, since these bodies do not melt so sharply as is indicated. Barbaloin, for example, when dried over sulphuric acid, softens at 142° C., and becomes transparent, but remains fixed to the sides of the tube at 147° C.; but it does not flow, and is not truly melted. Examining a specimen of "crown" Uganda aloes, sent by Hearon, Squire and Francis, the author found it to contain 6 per cent. of aloin, yielding a chloro-acetyl body, melting-point, 162.7 C. This aloin is therefore identical with that of Jafferabad aloes. Uganda aloes also contains no isobarbaloin. Incidentally, the author states that

during a visit to the society's museum he was able to identify a specimen of aloes, sent to him from London as a true specimen of Barbados aloes, as Uganda aloes. Suspicion had been aroused as to the authenticity of this sample from the fact that it contained no isobarbaloin.—*Pharm. Journ.*, June 15, 1907, 779; from *Journ. de Pharm. et Chim.*, 25 (1907), 476.

Sisiak—*An East India Rat Poison*.—E. M. Holmes has received from Mr. R. T. Christopher of the Straits Pharm. Assoc., Singapore, the roots and leaves of a monocotyledonous plant, which is known by the name of "sisiak" and is used very successfully by the natives as a rat poison.—The plant has been identified as

Dianella Cærulea, nat. ord. Liliaceæ. It is used by infusing the bruised fresh roots and stems (not leaves) in boiling water, straining, and then boiling rice or Indian corn in the infusion. The poisoned grain is scattered about the patti (rice) fields at night, in which rats are very destructive, hundreds of dead rats being found in the field after one dressing.—*Pharm. Journ.*, Feb. 9, 1907, 128.

IRIDACEÆ.

Saffron—*A New Method of Valuation*.—In a paper read at the recent meeting of German Naturalists and Physicians (Stuttgart, Sept., 1906) Dr. B. Pfyl communicates the details of a comprehensive proximate analysis of saffron, undertaken in conjunction with Dr. W. Scheitz, from which it appears that genuine saffron contains a large quantity of substances, soluble in chloroform, which have the property of reducing Fehling's Solution. One of these substances was obtained in a crystalline condition, and yielded on hydrolysis an oil and levulose. Inasmuch as commercial sugars are insoluble in chloroform and the other possible adulterants contain no substances that reduce Fehling's Solution, the authors propose a method for the valuation of saffron which is based on its power to reduce alkaline copper solutions. They find that 5 Gm. of pure saffron (stigmas) contain reducing substances corresponding on the average to 170 Mgm. of copper, while, for example, a mixture of 50 per cent. of pure saffron and 50 per cent. of pistils reduced a quantity of Fehling's Solution corresponding only to 60 Mgm. of copper.—*Pharm. Ztg.*, li, No. 77 (1906), 851.

ARISTOLOCHACEÆ.

To-Ko—*An Aromatic Chinese Drug*.—Y. Asahima has identified an aromatic Chinese drug, known as "To-Ko," to consist of the dried herbaceous portion and roots of *Asarum blumei*. It yielded 1.4 per cent. of a volatile oil, having a sassafras-like odor, in which he has determined eugenol, safrol, and a terpene-like constituent. The author, furthermore, finds that the drug known in Chinese and Japanese commerce by the name of

Sai-sin or *Si-sin*, the source of which has been referred to *Asarum sieboldi*, is also derived from *A. blumei*, and consequently identical with "To-Ko."—Pharm. Ztg., li (1907), No. 47, 489; from Journ. of Pharm. Soc. of Japan, April, 1907.

LAURACEÆ.

Camphor—Culture Experiments in Algeria.—J. A. Battandier, reporting on the camphor-tree cultivation in Algeria, states, contrary to the views previously held, that the tree grown in the Mediterranean countries contains as much camphor as in the country of its origin. In view of the large fluctuations, however, to which, in Algeria, as everywhere else, the various individual specimens are subject, he regards it of general interest to cultivate the camphor tree by selection, more particularly as it grows very well from seed, and can be readily multiplied by oculation.—Schimmel's Rep., April, 1907, 24; from. Journ. de Pharm. et Chim., vi, 25 (1907), 182.

Camphor—Encouragement of Cultivation and of Synthetic Production in Japan.—Some statements made in Schimmel's Rep. for Oct.-Nov., 1906, have induced T. Kumagai to enter into the question of the danger which might threaten Japan, if it were possible to make serious competition with the monopoly, on the one hand by the production of natural camphor in other countries, and on the other hand by the manufacture of synthetic camphor. The author believes such a danger possible beyond the shadow of a doubt, and therefore advises that Japan should in good time take preventive measures. He looks for such chiefly in the forestry policy and the chemical technology. Care should be taken to lay out new cultivations of camphor trees, extending outside of Formosa also over Japan and eventually to Korea; taking the greatest possible advantage of the experience gained in the science of forestry, providing free instruction in the cultivation, planting, distillation, etc., and placing light portable apparatus for a rational distillation, for a small consideration, at the disposal of parties interested. From the point of view of chemical technology, the measures which come under consideration are, a rational cultivation of plants yielding oil of turpentine suitable for the production of synthetic camphor, and search for a material even more suitable for this purpose. Competition could be met by a suitable extension of the monopoly so as to include artificial camphor.—Schimmel's Rep., April, 1906, 21; from Deutsche-Japan Post, Yokohama, 5 (1907), 8.

Camphor and Camphor Oil—Yield from Trees Cultivated in Indo-China.—C. Crévost makes some interesting observations with regard to the cultivation of the camphor tree in Indo-China, which, in Tonquin, Kwang-Tcheou-Wan, and particularly in Annam, qualifies the most sanguine expectations. Various samples distilled by Aufray, the Director of the Ton-

quin Laboratory, gave the following results as compared with Japan camphor (= camphor oil and camphor) :

	Japan.	Tonquin.	Kwang-Tcheou-Wan.
Ordinary branches.....	3.70 per cent.	3.90 per cent.	3.25 per cent.
Lower portion of trunk.....	4.23 per cent.	2.70 per cent.	3.55 per cent.
Roots	4.46 per cent.	4.60 per cent.	3.55 per cent.

The comparatively small yield from the trunk in the case of the Tonquin sample is explained on the ground that the sample was taken from a hollow tree of very medium quality.—Schimmel's Rep., October-November, 1906, 20 ; from Journ. d' Agric. Trop., 6 (1906), 105.

East-African Camphor Oil—Yield, Characters and Constants.—Schimmel & Co. have examined a camphor oil recently received from the Imperial Biologico-Agricultural Experimental Station Amani in German East Africa, which had been obtained in a yield of not quite 1 per cent. by distillation of the leaves and branches of camphor trees, respectively $1\frac{1}{4}$ and $2\frac{1}{4}$ years old. The oil was a filtrate of the original oil which separated camphor spontaneously, but as originally received contained 75 per cent. It was golden-yellow in color, had an odor considerably different from that of ordinary camphor oil, and when cooled congealed into a solid mass. Its sp. gr. at 15° C. was 0.9236 ; optical rotation, + 39° 20' ; acetylation No. 14.5 ; soluble in 0.25 vol. of 90 per cent. and in 10 vol. of 80 per cent. alcohol. It contained traces of a phenol which had an odor like carvacrol, but eugenol, which is a constituent of ordinary camphor oil, could not be detected, nor was borneol present in appreciable quantity. Furthermore, this camphor oil differed from Japan oil by the absence of safrol. To what extent the difference observed may be due to the use of different parts of the plants for the distillation of the respective oils, is an open question.—Schimmel's Rep., October/November, 1906, 20.

Camphor—Adulteration with Stearic Acid.—In the course of some interesting observations concerning the increasing scarcity of camphor, and its consequent high price, etc., Dr. G. Weigel calls attention to an adulteration of camphor in cubes recently observed by him. The sample contained only about 50 per cent. of true camphor, the remainder being evidently composed of stearic acid. The latter remained undissolved in cold alcohol, but was soluble in warm alcohol, from which it separated in crystalline form on cooling. The high acid number of the adulterated camphor, 103.8° C., also speaks for the assumption that the adulterant is commercial stearic acid, which, as is known, has an acid number of 200° to 210° C., while by doubling the acid number found (2×103.8) the figure 207.6 is obtained.—Pharm. Centralh., xlviii, No. 42 (1906), 865.

Borneo Camphor Trees—Question of the Presence of Borneol.—The ques-

tion of the presence of camphor or borneol in the Borneo camphor trees (*Dryobalanops aromatica* Gaertn.) cultivated in the Botanical Gardens of Buitenzorg, has frequently been discussed there. It is now mentioned by Schimmel & Co. that in a recent investigation a separation of camphor or borneol could not be detected in the wood of the felled trees, but when a hole was bored into a living tree, a white substance was deposited in the hole which consisted chiefly of borneol. By distillation with steam two oils were obtained, one from the leaves, the other from the trunk, which, according to their behavior on boiling (150° to 210° and 215° to 280° C. respectively), did not appear to contain borneol. Only a few cubic centimeters of each oil being available, this question could not be decided.—Schimmel's Rep., April, 1907, 25.

"*Engkala*"—*A Delicious Fruit of Borneo*.—H. N. Ridley describes in the "Agricultural Bulletin of the Straits Settlements," a new fruit called "engkala," which is said to be of a delicious flavor. It is well known to Europeans in Sarawak, Borneo, but apparently not known elsewhere. It is the product of *Litsea persella*, a large lauraceous tree. The fruit is eaten raw or used in curries.—Pharm. Journ., Aug. 4, 1906, 147; from Gard. Chron., 39, 368.

Surinam Yellow-wood—Characters of Coloring Matter.—W. H. Bloemental has determined the yellow coloring matter of the two dye-woods known in commerce as "Surinam Yellow-Wood," to be identical with the "Lapachol" of Paterno, a naphthalin derivative having the formula, $C_{15}H_{14}O_3$. The two Surinam dye-woods, although thus shown to contain identical coloring matters, belong to different families—the one being derived from a Lauracea (*Nectandra rodiazi* Hook), the other from a bignoniacea, *Tacoma leucaxylon* (L) Mart, and are easily distinguished by their microscopic structure.—Pharm. Ztg., li, No. 68 (1906), 758; from Pharm. Weekbl., 1906, No. 26.

MYRISTICACEÆ.

Nutmeg Tree—A Monœcius Specimen.—J. H. Hart, Superintendent of the Botanic Gardens, Trinidad, reports on the examination of sixteen-year old nutmeg trees growing in the grounds of Mr. J. W. Crosbie, of Trinidad, which has been observed during the last four years to bear both male and female flowers. His examination proved the presence of both kinds of flowers on the same branch of this tree, and he therefore suggests that an attempt should be made to perpetuate this variety by grafting, since the planter has, as a rule, to wait many years after planting the seed, to see whether it will produce a fruit-bearing or a male tree.—Pharm. Journ., June 8, 1907, 749; from Bull. Bot. Dept., Trinidad, No. 54, April, p. 202.

POLYGONACEÆ.

Polygonum Dumetorum L.—*A Valuable Aperient*.—Dr. Tunmann calls

attention to the valuable aperient properties of *Polygonum dumetorum* L., a common weed in Germany, growing in moist copses, beside hedges and fences. The entire plant is used in the form of a decoction (1 : 20), and has proven in many cases more efficient than compound licorice powder, tamarinds, or aloes, etc., in chronic constipation, and fully as effective, if not superior, to senna leaves or frangula bark. On drying, the herb yields 25 per cent., the leaves 19 per cent. of dry substance. Preliminary investigation seems to indicate that the aperient activity of the plant is due to tanno- and anthra-glucosides. Free emodin is not present in the plant.—Pharm. Centralb., xlvii, No. 41 (1906), 843.

Chinese Rhubarb—Collection and Source.—E. H. Wilson, having lately visited western China, is able to give some new and interesting facts concerning the collection and source of Chinese rhubarb. While it is possible that two or more species may be involved, he is convinced that the bulk of the commercial drug is furnished by one species, namely :

Rheum Officinale, Baillon, and the chief source is the wild mountainous region of the Szechuan-Tibetan border, and the range of mountains extending from this border to the province of Hupeh, Central China. This range (Kiu-tiao-shan) separates the province of Szechuan from Kansu and Shensi, and forms the watershed of the Han and Yangtsze rivers. A certain amount of the medicinal product is collected in Hupeh, and finds its way to Hankow, where it is classed with the Szechuan product. In the Imperial Maritime Customs trade returns, the whole of the rhubarb exported from Hankow is given as Szechuan rhubarb, and there can be no question that the chief source of the drug are the mountains of Western, Northwestern and Northern Szechuan. In the author's personal knowledge of the wild plant as it occurs in the Szechuan-Tibetan border it extends from south of Tchien-lu to north of Sungpan, on the Kansu border. The plant occurs in the forests 8,000 feet above sea-level, becoming more abundant in the ascent and reaching its maximum between 11,000 and 12,000 feet. It extends up to 14,000 feet, the highest altitude of any tall growing herbs in these regions. The medicine gatherers of these regions root up only the oldest specimens, which from experience they readily recognize. Ten years is regarded as the minimum age, but this is probably not strictly adhered to. This forest product is not so highly esteemed as that found growing on the grasslands above tree-limit. "Ta Huang" is the name by which the drug is known all over China. The latter half of September and October is the season for digging the rhubarb, but the process is carried on until snow finally renders it impossible. Occasionally a spring digging is resorted to. This takes place before the plants commence to make much growth. *Rheum officinale* has a distinct stem, not very long, but thick, and this, the author was informed, was considered better than the roots. It was severed from the roots, cleaned, the bark and crown removed, and then split transversely, or more commonly longi-

tudinally into pieces 4 to 6 inches long. Very often a hole is bored through the pieces, and they are strung on a cord and dried under the eaves of the houses. The roots vary in size, and are often very large: 4 to 5 feet long and from 3 to 4 inches in diameter is not unknown. These roots have all the weak laterals removed, and are cleaned, roughly trimmed, cut into lengths, and often divided longitudinally. Sometimes a hole is bored through them, and they are strung up beneath the roofs of houses immediately, or they may be partly or wholly dried in the sun or on heated stones. At Tatien lu, where the climate is very moist, partly drying the freshly gathered roots over brushwood fires is often resorted to. The medicine gatherers only trim and prepare the drug very roughly; it is in the shops and warehouses of the dealers at Chungpa, Mien-chu, Kuan-Hsien and Yachow that the drug is finally trimmed, sorted and graded ready for export.—Chem. and Drugg., Sept. 1, 1906, 371.

Chinese Rhubarb—Commercial Sorts, Chemical Constituents, Etc.—A. Goris and L. Crété give a comprehensive description of the commercial sorts of Chinese rhubarb, their physical characters of distinction, their chemical constituents, etc., from which it appears that at the present time three varieties are found on the market, designated respectively "Shensi," "Canton" and "Shanghai" in accordance with the locality from which it is exported. Of these three varieties that designated as "Shensi" is the least frequent sort found on the market and the most expensive. It is distinguished from the other two sorts, particularly by the fracture, which is uniformly granular, even in the lighter pieces, almost brittle, distinctly marbled, and the bright-red medullary rays regularly arranged towards the outer side. The odor is particularly agreeable and the taste faintly aromatic and bitter, whereas in the other sorts the odor is smoky or empyreumatic, and the taste unpleasantly mucilaginous and persistently bitter. These differences in odor and taste permit the recognition of Shensi rhubarb even when cut up or powdered; the latter being moreover always darker in color and more of an orange-yellow, than Canton or Shanghai rhubarb, which produce a lighter, ochre-yellow powder. As regards the chemistry of the Chinese rhubarbs, the authors enumerate four distinct anthraquinone derivatives, viz., *Chrysophanic acid* (= Dioxymethylantraquinone); *Emodin* (= Trioxymethylantraquinone); *Rhein* (= Tetraoxymethylantraquinone), and *Rheochrysin* (= Trioxyanthraquinonemethoxide). They regard the crystalline body described by Gilson as "Rheopurgin" to be, as admitted by the latter, simply a mixture of these four anthraglucosides. The tannoid glucosides of these rhubarbs are: *Glucogallin*, which splits into gallic acid and glucose; *Tetralarin*, splitting up into glucose, gallic acid, cinnamic acid and rheosmin; and *Catechin* which has a constitution analogous to that in *Catechu*. The other constituents mentioned as being contained in rhubarb—rheumin, rheum-yellow, chrysophan, rheic acid, cathartic acid, are not well defined compounds,

and are regarded as more or less pure derivatives of oxymethylantraquinone. The nigrines are regarded as products of the polymerization of the oxymethylantraquinones, to which they bear the same relation as phlobaphenes do to the tannins.—Pharm. Ztg., lii, No. 39 (1907), 406; from Bull. d. Scienc. Pharm., February, 1907, 93-104.

English and French Rhubarb—Proximate Examination and Botanical Source.—A. Tschirch and J. Edner report the results of comprehensive experiments undertaken for the purpose of ascertaining, through the nature and characters of their anthraglucosides, the botanical derivation of the English and French rhubarbs. Their results make it evident that English rhubarb is derived from *Rheum officinale*, although *R. rhaponticum* is also cultivated, while French rhubarb is exclusively the product of the last-named species.—Arch. d. Pharm., 245 (1907), No. 2, 139-149.

Rhubarb—Colorimetric Estimation.—Caesar and Loretz, in their Fall Report (1906), remark that the colorimetric method proposed by Tschirch for the estimation of rhubarb (see Proceedings, 1905, 627) has proven satisfactory when slightly modified. 10 Gm. of the drug are boiled 15 minutes with 50 Cc. of diluted alcohol, filtered, and the filter washed with 20 to 25 Cc. more of diluted alcohol. The filtrate and washings are then evaporated until the alcohol is completely expelled, the residue is diluted with water to 10 Cc., allowed to cool, and shaken with 10 to 15 Cc. of ether. If the rhubarb is genuine the liquid remains clear, even after standing 24 hours, whereas in the case of rhapontic rhubarb a considerable deposit of colorless, needle-shaped prisms forms, and this increases on standing until the entire bottom of the vessel is covered with a crystalline crust. If these crystals are collected on a filter, washed with water and dried, they produce a purple-red color with sulphuric acid, which soon changes to orange.—Pharm. Ztg., li, No. 75 (1906), 830.

Rhubarb—Gravimetric Method of Valuation.—A. Tschirch and J. Edner, after an unsatisfactory attempt to determine the oxymethylantraquinones in rhubarb volumetrically by means of para-diazonitroaniline, have devised and recommend the following gravimetric method. This depends upon the phenolic character of the oxymethylantraquinone and its consequent formation, in common with phenols in general, of an insoluble compound with *p*-diazonitroaniline, from the ascertained weight of which the amount of chrysophanic acid is calculated on the basis of 4.47 : 2.54, or in round numbers, 4.5 : 2.5.

The reagent is prepared as follows: 5 Gm. of paranitroaniline, 25 Cc. water and 6 Cc. of concentrated H_2SO_4 are shaken together in a 500 Cc. glass-stoppered flask; 100 Cc. of water are added, followed by a solution of 3 Gm. sodium nitrite in 25 Cc. of water, and finally sufficient water to make 500 Cc. This reagent must be protected from light.

The assay is conducted as follows: 0.5 to 1.0 Gm. of the powdered

drug is repeatedly boiled with diluted alcoholic KOH until it is completely exhausted. The united filtrates, which contain besides the free and hydrolized oxymethylantraquinones also the products of the hydrolysis of the tannoglucosides of the drug, are subjected to distillation to remove the alcohol, diluted with water, acidulated with hydrochloric acid, the resulting precipitate collected on a filter, washed with acidulated water and dried. The filter with precipitate is then transferred to a Soxhlet and extracted with chloroform, which leaves the rheotannic acids undissolved—this process requiring several hours. The chloroform being removed by distillation, the residual anthraquinones are dissolved by the aid of heat in 10 Cc. of 5 per cent. solution of sodium hydroxide and diluted with 50 Cc. of water; 20 Cc. of the diazo-reagent are then added, followed, drop by drop, by hydrochloric acid, with vigorous shaking, until the solution is decolorized, and the coloring matter completely precipitated. Having ascertained that the supernatant solution has an acid reaction, the precipitate is allowed to subside during several hours, is then collected on a filter, previously dried at 100° C and weighed, washed until the acid reaction completely disappears, and is then dried at 70° C and weighed. The ascertained weight is then converted into terms of chrysophanic acid (on the basis of $4.5=2.5$) in a table appended by the author, the results obtained by this method and a comparison of the same with those obtained by two colorimetric methods, show the differences to be on the whole inconsiderable, in general somewhat higher by the proposed gravimetric method. The actual average results with different sorts of rhubarb were as follows: Rhizoma rhei (from the collection), 3.690 per cent.; Shensi rhubarb, 3.2 per cent.; Canton, ii, 2.67 per cent.; Canton, round, 4.24 per cent.; Canton, flat, 3.35 per cent.; Shanghai, 4.14 per cent.; Shanghai, flat, 2.70 per cent.; English rhubarb, 2.07 per cent.; French rhubarb, 1.58 per cent. By the two volumetric methods, Austrian rhubarb was found to contain 1.6 per cent.; Rhapontic rhubarb, cultivated in Bern, 1.2 per cent., and a specimen of Shensi flat, 3.30 per cent. chrysophanic acid.—Arch. d. Pharm., 245 (1907), No. 2, 150.

Rumex Crispus.—*Notable Increase of Iron Content by Cultivation*.—It has been pointed out by Saget (1904) that *Rumex crispus* is characterized by a large iron-content under normal conditions, and that this may be markedly increased under appropriate conditions of cultivation. Following up the same line of study, A. Gilbert and P. Lerebulet have now determined that by the addition of iron carbonate to the soil, the normal content of iron in the plant was increased during a single season from 75 Mgm. in the roots and 28 Mgm. in the stems and leaves, in 100 Gm. of dry substance, to 447 Mgm. and 269 Mgm. respectively, and that if the treatment was continued for 3 or 4 years, the iron content of the root powder was increased up to 3 per cent., composed in equal proportions of organic and inorganic iron. The high content of organic iron has led to

therapeutic experiments, which have resulted favorably in certain cases of chlorosis; the powdered root being given in daily doses of 1.5 to 3.0 Gm. — Pharm. Ztg., li, No. 68 (1906), 758; from L'Union pharm., 1906, No. 6.

SCROPHULARIACEÆ.

Digitalis Leaves—Relative Medicinal Value of First and Second Year's Growth.—E. H. Farr reports the results obtained by Dr. G. S. Haynes with two tinctures carefully prepared from the leaves of *Digitalis purpurea*, the one the first year's leaves and the other the leaves of flowering plants, growing together in open situations, the leaves being carefully dried, powdered and sifted, the powder including the petioles in each case. The results obtained by Dr. Haynes show that there is little, if any, difference in potency between the first and second year's leaves when collected from plants grown under similar conditions, the slight difference recorded being possibly attributable to the slightly larger proportion of petioles in the first year's leaves. It is noteworthy that in the London Pharmacopœia instructions were given to remove the petioles before drying digitalis leaves for medicinal use.—Pharm. Journ., Feb. 23, 1907, 198.

Linaria Vulgaris—Chemical Constituents of the Flowers.—T. Klobb and A. Fandre have subjected the flowers of *Linaria vulgaris* Trag. to proximate examination. The hot alcoholic extraction contained mannite, sugar and *linarin* ($C_{14}H_{16}O_7$). The latter is readily oxidized, even on exposure to air in alkaline solution, the decomposition manifesting itself by the development of an odor reminding of anise and cumarin. The product of oxidation, which the authors have named *linarodin* ($C_9H_{10}O_2$), may be separated by distillation and obtained pure by subsequent shaking out with ether.—Pharm. Ztg., lii (1907), No. 5, 48; from Bull. des Scienc. Pharm., Oct. and Nov., 1906.

Linaria Vulgaris—Proximate Examination.—A. Fandre has subjected the herb of *Linaria vulgaris* to proximate examination. The petroleum-ether extract contains a saturated hydrocarbon which crystallizes from ether and is almost insoluble in alcohol; it melts at $57^\circ C$. The same extract contains a phytosterol, in flat hexagonal crystals, m. p. $138^\circ C$. The alcoholic extract contains mannite, glucose and several other sugars. It also yields *linarein*, $C_{14}H_{16}O_7$, m. p. 255° to $256^\circ C$., which Schlagdenhauffen and Reeb have previously isolated and described as linaric acid; the author, however, fails to obtain evidence of any acid function. On oxidation it forms *linarodin*, $C_9H_{10}O_2$, which has an agreeable odor, recalling that of anise and cumarin. It distills with steam and melts at $36.5^\circ C$., subliming at a higher temperature. It is neutral to litmus, soluble in water, and reduces ammoniacal silver nitrate. It gives no color reaction with ferric chloride and does not combine with sodium acid sulphite, so it is neither a phenol nor an aldehyde.—Pharm. Journ., Dec. 15, 1906, 673; from Rép. de Pharm., 1906, 499.

SOLANACEÆ.

Capsicum—Adulteration in Austria.—According to J. Hockauf, powdered capsicum is frequently mixed with about 1 per cent. of fixed oil to improve its appearance, and such oiled powders often contain more or less maize starch, maize meal, etc. These are best detected by mixing a little of the powder on a slide or on a watch-glass with an alcoholic solution of iodine (1 in 15), and then adding solution of chloral hydrate. When now examined under the microscope many of the oil globules will appear dark blue, and remain so for half an hour. When the preparation has become quite clear a little more solution of chloral hydrate is added. In this way the various tissues are admirably shown, and the starch now appears pale blue. By this method the extraction of the fat by means of ether or ether-alcohol may be avoided.—Pharm. Journ., July 28, 1907, 106; from Ztschr. d. Oesterr. Ap.-Ver., 44, 303.

Datura Arborea—Alkaloidal Content of Leaves and Petiole.—H. Beckurts communicates the results of alkaloidal assay of the leaves and leaf-stalks of three cultivated specimens of *Datura arborea*, carried out by Prochnow in the Pharmaceutical Institute of the Technological High School in Brunswick. Employing a modification of Keller's process, the leaves, dried to constant weight, yielded respectively 0.45, 0.45 and 0.438 per cent. of alkaloid (mainly scopolamine), while the dried petioles from two of the specimens yielded respectively 0.223 and 0.23 per cent. of alkaloid.—Apoth. Ztg., xxi, No. 63 (1906), 662.

Tobacco—Alkaloidal Constituents.—While nicotine has been the subject of exhaustive investigation, very little is known concerning the subsidiary bases which are believed to accompany it as a constituent of tobacco. To throw some light on the nature of these, Amé Pictet has undertaken a series of investigations, which reveal the presence of at least four additional bases, although these are present only in a total quantity not exceeding 3 per cent. of the nicotine contained in an aqueous extract of the tobacco. This extract was obtained from dry Kentucky tobacco leaves by macerating them for a very short time in luke warm water and evaporating the infusion so obtained in a vacuum to a density of 40° B. It contained about 10 per cent. of nicotine, which was isolated by simply liberating it with soda and distilling with steam. From the crude nicotine on fractionation two subsidiary fractions were obtained, the one below 100° C., the other at a temperature somewhat higher than that at which nicotine passes over. The first of these fractions contains a base having the formula C_4H_7N ; the second contains a base isomeric with nicotine, $C_{10}H_{14}N_2$, which the author has named *nicotimine*. Two other bases were isolated by shaking out the alkaline residue remaining in the still after the distillation of the crude nicotine from the extract with ether, and subsequent separation by fractional distillation; the one a liquid of the com-

position $C_{10}H_{12}N_2$, and consequently containing 2 atoms less of hydrogen than does nicotine, which the author designates as *nicotéine*; the other a solid base, $C_{10}H_8N_2$, which he names *nicotellin*. The relative proportions of these to 100 Gm. of nicotine, are as follows: Nicotéine, 2 Gm.; nicotimine, 0.5 Gm.; the base C_4H_9N , 0.2 Gm.; nicotellin, 0.1 Gm.

Nicotéine, $C_{10}H_{12}N_2$, is a colorless, strongly alkaline liquid, miscible in all proportions with water, and remaining liquid in a freezing mixture of solid carbon-dioxide and ether at -80°C . It is distinguished from nicotine by its higher boiling-point (266° to 267°C .—that of nicotine being 226°), by its higher specific gravity (1.077 at 12°), its odor, which reminds of parsely, and its rotatory power -46° at 17°), which is only one-fourth as strong as that of nicotine. Moreover, while nicotine salts are dextrorotatory, those of nicotéine, as well as the base itself, are lævogyrate.

Nicotimine, $C_{10}H_{14}O_2$, the isomer of nicotine, resembles the latter in many respects in physical character, but differs in its chemical character, inasmuch as it is a secondary base. Indeed, its isolation became possible only by reason of this difference in the character of the two bases.

Nicotellin, $C_{10}H_8N_2$, differs in every respect from the other tobacco alkaloids mentioned. It is a solid body, crystallizing in small pure white prismatic needles, which melt at 147° – 148°C ., forming a colorless liquid, boiling a few degrees over 300° without decomposition. It is very sparingly soluble in water or in ether, its aqueous solution being neutral to litmus. It differs also in being the only tobacco alkaloid yielding a sparingly soluble bichromate.

Base C_4H_9N is a colorless, very mobile, strongly alkaline fluid, which distils over between 80° and 90°C . during the rectification of crude nicotine. It has a penetrating odor, reminding of piperidine, and it is to its presence that the unpleasant ammoniacal odor of crude nicotine is due, this being completely lost on rectification of the latter. The author's studies, in conjunction with Mr. Court, have determined the identity of this base with "pyrrolidine;" but whether the latter exists as such in tobacco, or is a product of the decomposition of nicotine is a question not easy to answer with certainty. The author has, however, convinced himself that prolonged boiling of pure nicotine with 20 per cent. sodium hydroxide solution does not result in the formation of pyrrolidine. Nor is its formation during the concentration of the infusion of tobacco likely to occur, and the author therefore *tentatively* assumes its pre-existence in the tobacco. Finally the author is impressed with the idea that the actual number of tobacco alkaloids is by no means exhausted by the present investigation. It appears to him that not only Kentucky tobacco may contain other bases, but that the examination of other tobaccos may result in the discovery of additional bases.—Arch. d. Pharm., 244, No. 5, (Sept., 1906), 375–389.

South African Tobacco—Small Nicotine Content.—Determinations of the amount of nicotine in South African tobaccos by McCrae—using Kissling's method—show that in general they contain only small quantities of alkaloid; the favorite tobacco grown in the Magaliesberg district, for example, yielded only 0.71 per cent. of nicotine. Several kinds, however, proved very rich in alkaloid, notably that grown in Barberton, in which 4.37 per cent. of nicotine was determined.—Pharm. Journ., March 2, 1907, 265; from Chem. Ztg., 31 (1907), 45.

Potatoes—Solanine-Content.—The conflicting statements in the literature concerning the natural content of solanine in potatoes, the supposed increase of alkaloid during storage, and whether such increase, if any, is due to germination or to bacterial influence (disease), has prompted the medical authorities of the German War Department to commission M. Wintgen to undertake a comprehensive investigation into the conditions that may be held responsible for variation in the alkaloid-content of potatoes, and the extent to which the increase in solanine in old or diseased potatoes may be held responsible for the toxic effects that have been recorded as resulting after eating such. Referring for the details of this very comprehensive investigation to the original paper, the conclusions reached by the author may be given here as follows:

1. The solanine content of potatoes varies decidedly in the different sorts, but is in general very much smaller than might be expected from the average figures given in the literature.

2. An increase of solanine after prolonged storage could not be observed in germinated potatoes after the careful removal of the germs.

3. An increase of solanine due to the influence of disease could not be determined with any certainty.

4. Nor could the formation of solanine by the influence of bacteria in a potato culture medium, as described by Weil, be confirmed.

Regarding the solanine poisonings that have been recorded, the author's investigations show that the content of solanine in no case was so great as to be held responsible for the acute symptoms of poisoning observed, even if as much as 1 Kgm. of potatoes had been consumed.—Arch. d. Pharm., 244, No. 5 (Sept., 1906), 360-372.

OLEACEÆ.

Indian Manna—A New Source.—David Hooper calls attention to a white, sweetish substance which was sent as a "gum" to the Indian Museum, by the Forest Divisional Officer, from Ellichpur, in the Central Provinces. It is an exudation from a tree,

Schreberia Swietenoides, Roxb., and on examination proved to be a manna. The manna-like exudations hitherto found in India have been obtained from various shrubs and trees removed from the *Oleacea*, but the

Schreberia, it is very interesting to observe, belongs to this family, and is allied to the ash trees which afford the commercial manna of Europe. The exudation dissolves in five times its weight of water, and yields to boiling alcohol a crystalline constituent having the properties of mannite or manitol.—Pharm. Journ., Sept. 1, 1906, 258.

Olive Leaves—Tonic and Febrifuge Value.—Dr. Sir James Sawyer calls attention to the therapeutic value of olive leaves, and suggests the preparation of a tincture. See *Tinctura Oleæ Foliorum*, under "Pharmacy."

HYDROPHYLLACEÆ.

Eriodictyon Glutinatum—Chemical Examination.—By extraction with petroleum-ether, G. Mosler obtained from the herb of *Eriodictyon glutinosum* a body having the consistence of ointment, which he found to consist mainly of the glyceride of a non-saturated fatty acid of the formula $C_{18}H_{32}O_2$, associated with a small quantity of a saturated fatty acid, while the non-saponifiable portion consisted of a higher paraffin, containing 27 to 31 atoms of C. After removal of the fatty matter with petroleum ether, the drug yielded to ether a crystalline body, for which the author preliminarily proposes the name

Eriodictyonon.—This appears to be a non-saturated compound (m. p. 214° – 215° C.) to which he assigns the formula $C_{18}H_{32}O(OCH_3)(OH)$. Other constituents determined in the drug are: iron-greening tannin, a sugar, and a gum-like substance.—Apoth. Ztg., xxii (1907), No. 18, 171; from Liebig's Annal., 1907, 233.

CONVOLVULACEÆ.

Dichondra brevifolia.—A New Zealand plant possessing specific bactericidal action on the diphtheria bacillus. See *Armadiphtherin*, under "New Remedies."

Jalap—Difficulty to Obtain Samples of B. P. Quality.—T. G. Joyce states that during the last few years he has been able, only with difficulty, to obtain samples of jalap satisfying the B. P. requirements, the highest percentage of total resin obtained being 11.46, while the majority of samples yielded amounts ranging between 6 and 8 per cent. It becomes yet more difficult to satisfy the two conditions of total resin and the amount of this soluble in ether, which should not exceed 10 per cent. A recent examination of thirteen samples of jalap on the English market gave the following figures:

Number of Sample.	Percentage of Moisture.	Total Per- centage of Resin.	Percentage of Ether-soluble Resin.
1	7.44	10.11	10.77
2	4.28	9.01	13.49
3	5.23	7.60	15.37
4	9.62	9.30	9.99
5	10.82	6.10	12.63
6	11.43	7.39	12.10
7	11.65	6.45	8.09
8	9.29	5.62	20.58
9	11.69	10.29	33.56
10	13.83	7.67	6.89
11	10.89	5.05	14.06
12	11.46	5.76	7.85
13	10.25	5.29	11.99

—Chem. and Drugg., March 30, 1907, 488.

Ipomœa Turpethum.—Characters of *Glucosidal Constituents*, which see under "Organic Chemistry."

Kaladana.—*Proximate Constituents*.—David Hooper calls attention to a recent examination of the proximate constituents of the seeds of

Ipomœa hederacea, an East Indian drug known as "kaladana," under investigation by the Indigenous Drugs Committee of the Indian Museum. The powdered seeds were examined by the authors of the "Pharmacographia," who found in them 14.4 per cent. of oil and 8.2 per cent. of a resin resembling the convolvulin of jalap tubers. An analysis of the seeds at present being distributed for experiment showed the following composition :

Moisture	9.40
Fat	14.02
Resin	8.06
Albuminoids	22.68
Carbohydrates	31.55
Fiber	8.40
Ash	5.90
<hr/>	
100.00	

The seeds are comparatively rich in nitrogenous substances, but the presence of a nauseous-tasting fat is a disadvantage in a medicine administered internally.—Pharm. Journ., Sept. 1, 1906, 258.

Merzemia Filicifolia.—*Presence of a Cyanogenetic Glucoside in the Leaves*.—Wechnizen has determined the presence of a cyanogenetic glucoside in the fresh leaves of *Merzemia filicifolia*. The fresh, crushed

leaves, after digestion for eight hours at 35° to 40° C., yielded 0.04 per cent. of hydrocyanic acid, which, as in the case of almonds, is produced by the action of an enzyme on a glucoside. This is demonstrated by exposing the fresh leaves for a moment to boiling water, whereupon the enzyme is destroyed and hydrocyanic acid can no longer be obtained from them.—Pharm. Centralh., xlviii (1907), No. 18, 364; from Pharm. Weekbl., Sept. 1, 1906.

BIGNONIACEÆ.

Sesame Oil—Poisonous Effects Produced by a Product of French Origin.—E. Rautenberg mentions that two cases of severe blood-poisoning following the administration of sesame oil have been recorded. The oil in question was of French origin, and exhibited its toxic properties when administered to animals. German sesame oil and other specimens of French oil were found to be perfectly free from any toxic constituent, which cannot, therefore, be considered to be of constant occurrence in French oil.—Pharm. Centralh., xlviii (1907), No. 6, 115; from D. Arch. f. Klin. Med., 86 (1907), 1-3.

LOGANIACEÆ.

Pinkroot—Substitutions.—W. W. Stockberger has prepared an elaborate paper for the Bureau of Plant Industry, U. S. Department of Agriculture, with the object of tracing the beginning and development of the confusion concerning the drug known as pinkroot, which has made it possible for an entirely unrelated product of extremely doubtful efficiency to masquerade successfully before the drug expert as well as the drug dealer for many years as the genuine article, and well nigh drive the latter out of commercial existence. This subject has been treated before by Mr. Stockberger, in a paper communicated to this Association (see Proceedings, 1905, 324-326), in which he pointed out that this substitute for the true pinkroot, *Spigelia marilandica* L., is the so-called "East Tennessee Pinkroot," which, on the authority of Maisch and others, was said to be derived from *Phlox Carolina*, belonging to the *Polemoniaceæ*, but which has since been proven to be derived from an *Acanthaceæ*, namely:

Ruellia ciliosa, Pursh. In fact there is no valid reason for believing that *Phlox* occurs at all, except perhaps in rare cases, as an adulterant of spigelia, and the author is decidedly of the opinion that aside from *Ruellia* the adulterant of spigelia may be regarded as accidental, due in the main either to carelessness of the collector in not sorting out the roots with which the plant would be associated in its growth, or to a lack of familiarity with the plant. In fact other roots sometimes occur in spigelia, such as *Saponaria officinalis*, L., *Aristolochia serpentaria* L., *Hydrastis canadensis* L., *Dioscorea villosa* L., and *Collinsonia canadensis* L., which clearly must be regarded rather as impurities than as adulterants. The text of this interesting paper is illustrated by numerous cuts showing the morpho-

logical and anatomical characters of the roots and rhizomes of the several plants under discussion, and full-page cuts of the two plants immediately concerned.

Ruellia being the only important adulterant found in Spigelia, a simple preliminary examination may serve to show the character of material offered as pinkroot, since Ruellia differs very markedly in appearance from Spigelia and is easily separated from it. If the underground roots or rhizomes are to be examined under the microscope, they should be placed for a time in water to soften the tissues and render them less refractory to the knife in cutting. Thin sections may be floated out on a drop of water on a glass slide and readily examined with a microscope or good hand lens. A comparison of the structures observed with those of Spigelia, Ruellia and Phlox (shown in the author's paper) will readily serve to identify the section. The structures under observation may be rendered more distinct by the use of zinc chloro-iodide. When the application of a drop of this reagent to the section is followed by the development of an intense blue color, particularly in the pith of the rhizome, Spigelia is indicated. If no blue color appears and large stone cells and cystoliths are seen in the cells of the cortex the material is Ruellia. Other roots and rhizomes being also occasional admixtures, the following key may serve for their distinction :

Cystoliths present	Ruellia.
Cystoliths wanting :	
Starch present	Spigelia.
Starch wanting :	
Corky layer 1—3 cells thick or wanting	Phlox.
Corky layer 3 to many cells thick.....	Soponaria.

The painstaking care with which the author has made his exhaustive compilation of the subject is shown by the profuse bibliography appended to the paper, which comprises over 250 references to different authors.—Pharm. Rev., January to April, 1907, p. 2-21-33-47-66-84, and 97-107.

APOCYNACEÆ.

Acocanthera Schimperi—*Therapeutic Application*.—Stadelmann finds that the wood of *Acocanthera schimperi*, from which Leuin has recently isolated *amorphous ouabine* (which see under "Organic Chemistry"), may be used with advantage in the form of infusion or decoction, and recommends the following prescription :

Infus.-Decoct. ligni acocantheræ, from 1.0 to 1.5 Gm.....	160.0
Syr. simpl (or syr. rubi idæi).....	30.0
Aq. menth. pip.....	10.0

Dose, 6 to 8 tablespoonfuls during 24 hours. The bitter taste of the

drug is materially covered by the syrup and mint water, and is more agreeable than that of an infusion of digitalis, for which it is recommended as a substitute, while no by-effects have been noticed.

Amorphous Ouabaine, obtained from this wood, has, according to Stadelmann, an action somewhat like digitoxin, over which it possesses the advantage that it can be injected subcutaneously in aqueous solution without producing pain, whereas digitoxin administered in the same way produces violent inflammation. Injections of 0.0003 to 0.0004 Gm. (= 0.3 to 0.4 Mgm.) of ouabaine in 1 Cc. of water, administered three times daily, have the same effect in cardiac affections as digitalis.—Pharm. Ztg., li, No. 100 (1906), 1105; from Berl. Klin. Wchsr., 1906, No. 50.

Strophanthus—Standardization.—E. W. Mann describes experiments conducted with the object of the direct determination of the active principle of strophanthus and not of decomposition products. Although his results are to a certain extent negative, they appear to show that it is possible chemically to standardize strophanthus. The standardization can, however, only have a real value when the botanical character of the seeds is fully established. The method of examination was as follows:

100 Gm. of the seeds was powdered and exhausted with petroleum spirit; the oil was separated and incidentally examined on the usual lines. The oil-free powder was air-dried, transferred to a Dreschel extractor, and percolated for thirty hours with boiling absolute alcohol; percolate was evaporated and the residue, when cold, taken up with water. To this aqueous liquid a slight excess of solution of basic acetate of lead was added, the liquid filtered, filtrate treated with excess of sodium sulphate, filtered, filtrate evaporated at low temperature with 10 Gm. of fine sand. The product was powdered and exhausted in a Soxhlet tube with boiling amyl alcohol; the bulk of the solvent was removed on a water-bath and evaporation and drying completed at 60° C.

The strophanthin obtained by the method described, recrystallized from amyl alcohol, formed long, colorless, needle crystals, which gave highly characteristic color reactions with sulphuric acid. Each was very slightly dextrorotatory in alcoholic solution, while in no case could a sharp melting-point be obtained for the anhydrous glucoside. The results obtained from this examination are as follows:

	S. Kombé.	S. Kombé. Mandala.	S. Nicholsoni.	S. Gratus.
Strophanthin, per cent.....	7.27	6.87	3.69	7.76
Color with 80 per cent. H_2SO_4	deep green	deep green	brown	brown
Strophanthin per cent. by the strophanthidin method	9.36	8.92	7.36	3.88

These latter figures in the cases of *S. Nicholsoni* and *S. gratus* exhibit such marked variation from those obtained by the direct method as to suggest that some essential difference exists in the chemical composition of the different glucosides.—Trans. Brit. Pharm. Conf. (Year-Book of Pharm.), 1906, 249-252.

Strophanthus Seeds—Desirable Modification of the B. P. Color Test.—Dr. Gordon Sharp points out the condition that determines the success or failure when applying the color test of the B. P. for recognizing genuine strophanthus seeds. The conditions necessary for success are two: (1) An acid of a certain degree of concentration, and (2) a certain degree of heat. Now, under favorable circumstances, when strong sulphuric acid is applied to the true strophanthus seed, the quantity of moisture in the seed is sufficient to raise the acid to the proper degree of temperature, and the green color is obtained. On the other hand, with an acid that has become hydrated, the necessary temperature is not got, and the test fails. All these difficulties can be overcome by modifying the official test in the following manner: Cut a strophanthus seed in four pieces, and place on a white porcelain dish in which are 20 minims of the dilute sulphuric acid of the Pharmacopœia. Let stand for one minute; next whisk the dish in the flame of a spirit lamp or a Bunsen burner. In half a minute, if the seed is genuine, the dark green color will appear at the extreme edge of the fluid, where the highest degree of concentration has taken place. In a few seconds the green color is seen over the whole field, and if the heat be continued the green is followed by red, garnet red, and finally black.—Pharm. Journ., Sept. 1, 1906, 258.

Nux Vomica and Preparations—Assay and Standard.—E. H. Farr and R. Wright contribute a lengthy paper on the assay of nux vomica, with particular reference to the powdered extract, embodying the following subjects: (1) the total alkaloids in nux vomica; (2) strychnine in nux vomica; (3) assay of nux vomica; (4) ratio of alkaloids to extractive; (5) experiments on menstrua; (6) liquid extract of nux vomica; (7) alkaloidal standards for nux vomica; (8) preparation of the standardized extract; (9) assay of the powdered extract; and (10) microscopic recognition of the powdered extract. Besides recording their own work under these headings: the authors make frequent reference to the comparable results of other workers. For the assay of nux vomica, which is performed on the powdered drug, the following methods have all been found to give reliable results if carefully worked:

(1) *Dunstan and Short's Process.*—Five Gm. of the powder is exhausted in a Soxhlet or other extraction apparatus for one or two hours with a mixture of 40 Cc. chloroform and 10 Cc. alcohol, and the alkaloids shaken out and purified in the usual way.

(2) *Bird's Process.*—Five Gm. of the powder is triturated in a mortar

with 2 Cc. of 10 per cent. solution of potash until uniformly moistened, and is then exhausted by extraction with a mixture of 4 vols. ether, 3 vols. chloroform, and 1 vol. amylic alcohol.

(3) Five Gm. of the powder is damped with a menstruum consisting of 70 per cent. alcohol containing 5 per cent. acetic acid B. P., packed in a small glass tube, to which an air-pressure ball has been attached, and exhausted by percolation under pressure with successive small portions of the menstruum until the percolate passes colorless and the residue from a few drops of the same fails to respond to Mayer's reagent.

(4) *Keller's Process Modified*.—This is carried out exactly as in the case of Bird's but the powder is not moistened before being added to the menstruum. For the latter they have employed a mixture consisting of 6 vols. ether, 2 vols. chloroform, and 1 vol. ammoniated alcohol. From the bulked percolates the alkaloids are shaken out with an excess of dilute sulphuric acid.

In the working of the above processes particular attention needs to be directed to the complete exhaustion of the drug. Of the four, the last-mentioned appears to effect this more rapidly than the others. The strychnine is determined in the total alkaloid by the modified nitric acid process described by the authors under *Strychnine*, which see under "Organic Chemistry." The authors conclude from the results of their experiments that the natural standards for nux vomica and its preparations are those of the U. S. P. viii, namely: 1.25 per cent. of strychnine for the drug; 5 per cent. for the powdered extract, 1 per cent. for the fluidextract; 0.1 per cent. for the tincture. The preparations of the B. P., obtained by following the official directions, uniformly contain too much strychnine.—Trans. Br. Pharm. Conf. (Yearbook of Pharmacy) 1906, 229-238.

Nux Vomica—Estimation of Strychnine by the Nitric Acid Process.—The process of the U. S. P., VIII, for the estimation of strychnine in the total alkaloids of nux vomica and its preparations depends upon the destruction of the alkaloidal nature of the brucine by nitration without affecting the strychnine—a process which was first suggested by Geroch (1889), but has since been modified by Nagelvoort, Keller, Gordin and others—the modification of Keller by Gordin (Proceedings, 1902, 336) being the one now official. M. H. Webster and R. C. Pursel, in view of the unsatisfactory results obtained by Lenton, and by Farr and Wright, with Gordin's process have carried out a number of experiments which point out that the lack of uniformity in results is due to the absence or varying proportions, if present, of the lower oxides of nitrogen in the nitric acid, and concluded that the most suitable reagent for nitrating the brucine would be nitric acid containing a fair proportion of the lower oxides of nitrogen in solution, this being secured either by substituting fuming nitric acid (commercial nitrous acid, sp. gr. 1.42) for the U. S. P. nitric acid, or, better, by adding to the latter a certain quantity of sodium nitrite.

Having become satisfied by their experiments that under this modification the U. S. P. process is accurate over a wide range of temperature, not alone when pure alkaloids are employed but also in the presence of such impurities as are unavoidably present in the process of assaying the drug, the authors suggest the following modification of the U. S. P. test: "Dissolve the alkaloidal residue in 15 Cc. of 3 per cent. H_2SO_4 . To this solution add 3 Cc. of a mixture of equal volumes of nitric acid (sp. gr. 1.4) and distilled water, then add 1 Cc. of a 5-per cent. solution of sodium nitrile in water and, after rotating the liquid a few times, set it aside for exactly 30 minutes, stirring it gently three times during the interval." The solution is then made alkaline and shaken out with chloroform in the usual way.—*Amer. Journ. Pharm.*, Jan., 1907, 1-7.

Nux Vomica—Unwarranted Modification of Strychnine Assay.—Referring to the preceding paper and to the fact that the U. S. P. VIII method for the assay of strychnine in nux vomica is usually regarded as being identical with the one published by him in 1902 (see Proceedings, 1902, 336), H. M. Gordin calls attention to the fact that the Committee of Revision has without good reason and "in spite of his vigorous protest," modified his method in such a way as to ruin it completely. In this method he had directed the use of nitric acid having the sp. gr. 1.42, and to add a little amyl alcohol at the end of the evaporation of the alkaloidal solution in order to avoid loss through spurting, conditions which impose no hardship, since an acid of sp. gr. 1.42 is readily obtained from any wholesale house and the simple addition of a few drops of amyl alcohol effectively prevents possible loss of strychnine. The inefficacy of the official nitric acid, sp. gr. 1.40, has been pointed out in the paper of Webster and Pursel, above quoted, while with the use of an acid of sp. gr. 1.42, and working according to the author's original directions, dozens of the author's students have invariably obtained satisfactory results.—*Amer. Journ. Pharm.*, Feb. 1907, 61.

Curare—Preparation on the Upper Orinoco.—A. Galliard, who was on board the first steamer to penetrate the regions of the Upper Orinoco, has now thrown some fresh light upon the composition and preparation of curare. It appears from a communication now published by Dr. Labesse, that two varieties of curare are produced, a weak one, which is used for birds and small animals, and a strong one, which is employed for large animals. The former is made from *Strychnos gubleri*, the latter from *S. toxifera*. In each case the fresh bark of the branches is scraped, boiled with water in large earthen vessels, with the addition of the leaves of a species of *Anthurium*. The decoction is strained, concentrated to a syrup in large shallow earthen bowls, and poured into gourds, in which it gradually stiffens, although it never becomes too hard to allow of the arrows being dipped into it. When the curare is sold its strength is demonstrated by

experiments on a small frog. In the Upper Orinoco *S. gubleri* is a common plant; the fruits resemble small oranges, the pulp of which, freed from the seeds, is edible; it has a sweet taste and slight aroma. *S. tixifera* is also widely distributed.—Pharm. Journ., Oct. 6, 1906, 381; from Bull. des Scien. Pharm., 13, 287.

MYRSINÆ.

Aegiceras Majus—*Toxic Saponins Present in the Bark and Fruits*.—H. Weiss has made a chemical examination of the bark and fruits of *Aegiceras majus*, a plant which is common in the mangrove swamps of the Eastern Hemisphere, and is known as a powerful fish-poison. Chloroform extracted from the powdered bark, a substance which was eventually obtained in colorless crystals melting at 84° C., the nature of which, however, could not be ascertained for lack of material. Alcohol (70 per cent.) removed amongst other substances a saponin which was separated by evaporating the tincture to dryness, dissolving in absolute alcohol, and precipitating with ether. The purification of the crude saponin thus obtained was effected by Greene's magnesia method, followed by repeated solution in alcohol and precipitation with ether. It was finally obtained as a yellowish white powder, readily soluble in water and dilute alcohol, soluble in hot absolute alcohol, but insoluble in ether. About 1 per cent. of this saponin is present in the bark. An examination of the fruits showed that a similar substance is also contained in the seeds, but not in the pericarps of the fruits; the seed saponin, however, differed from the bark saponin in its much more powerful action upon the red blood corpuscles. Both were poisonous to fish in a dilution of 1 to 50,000.—Pharm. Journ., July 28, 1906, 106; from Arch. d. Pharm., 244 (1906), 221.

STYRACÆ.

Benzoin—*Insoluble Matter, Ash and Acid Content in Commercial Sorts*.—Having a considerable number of duplicate specimens of benzoin from a series collected by a drug broker's clerk through a number of years, nearly all labelled with the technical names under which the drug broker classed them, E. M. Holmes, in view of the conflicting statements concerning the amount of impurity present, and particularly those concerning the presence of cinnamic acid in the different commercial varieties of benzoin, submitted them to Mr. E. Wightmann Bell for examination, who forwarded to him the following figures:

SUMATRA—INSOLUBLE MATTER AND ASH PER CENT.

	No.	Insoluble.	Ash.
Sumatra Firsts	1	4.50	0.60
Sumatra Firsts	—	8.46	0.83
Sumatra Firsts	2	5.82	1.12
Sumatra Firsts	1	10.62	1.23
Sumatra Firsts	5	10.66	0.95
Sumatra Firsts	3	20.83	2.43
Sumatra Low Woody	6	23.83	1.60

Cinnamic acid present.

PALEMBANG—INSOLUBLE MATTER AND ASH.

	No.	Insoluble.	Ash.
Palembang Firsts	7	4.66	0.83
Palembang Firsts	10	7.20	0.70
Palembang Good	8	3.32	0.66
Palembang Seconds	9	5.45	0.53
Palembang Thirds	11	29.98	1.58
BOMBAY.			
Bombay, very low	12	21.83	11.05
SOUTH AMERICAN.			
South American	25	22.16	4.65

Cinnamic acid absent.

SIAM—INSOLUBLE MATTER AND ASH.

	No.	Insoluble.	Ash.
Siam Blocky Firsts	13	1.00	0.14
Siam Firsts	17	2.63	0.10
Siam Glassy Firsts	20	1.66	0.26
Siam Blocky Firsts	23	1.33	0.12
Siam Firsts	26	1.41	0.33
Siam Very Fine Firsts	27	1.36	0.22
Siam Firsts	31	2.58	0.25
Siam	33	0.66	0.20
Siam Seconds, Dark	15	10.50	2.32
Siam Seconds	24	1.32	0.35
Siam Seconds	32	6.60	0.56
Siam Thirds	16	8.00	1.22
Siam Thirds	21	8.76	0.76
Siam Thirds	22	13.08	1.26
Siam Good Blocky	18	2.05	0.27
Siam Good	19	1.66	0.27
Siam Hard	30	1.65	0.28
Siam Small	28	4.17	0.45
Siam Siftings	14	3.92	0.88
Siam Siftings	29	11.33	0.96

Cinnamic acid absent.

SIAM—TOTAL ACIDS, FREE AND COMBINED, AS BENZOIC.

Sumatra No. 1.....	24.80
Sumatra No. 2.....	22.02
Sumatra No. 4.....	28.44
Sumatra No. 6.....	19.12
Palembang No. 7.....	25.65
Palembang No. 8.....	27.47
Siam No. 13.....	37.88
Siam No. 19.....	34.48
Siam No. 30.....	30.85
Siam No. 31.....	34.48
Siam No. 32.....	30.00

Saigon Benzoin.—(1) *Dark color*: Insoluble in alcohol, 10.80 per cent.; ash, 1.00 per cent.; total acids (as benzoic), 27.22 per cent. (2) *Light color*: Insoluble in alcohol, 5.30 per cent.; ash, 0.23 per cent.; total acids, 29.04 per cent. Cinnamic acid *absent* in both cases.

Storax Benzoin.—(1) *Small particles*: Insoluble in alcohol, 11.60 per cent.; ash, 1.30 per cent.; total acid, 20.57 per cent. (2) *Lump*: Insoluble in alcohol, 4.73 per cent.; ash, 0.16 per cent.; total acid, 36.62 per cent. Cinnamic acid *present* in both cases.—Pharm. Journ., Febr. 9, 1907, 127.

ERICACEÆ.

Rhododendron (*Alpenrose*)—*Yield and Character of Volatile Oil*.—Attention is directed in the Autumn (1906) Report of Heinrich Haensel to the volatile oil obtained by steam distillation to the amount of 0.123 per cent. from the leaves and flowers of the so-called "Alpine Rose" (*Rhododendron*, L.). The oil has a yellow color and the strong, aromatic odor of the fresh plant.—Pharm. Ztg., li, No. 80 (1906), 889.

Uva Ursi—*Chemical Distinction from Substitutes*.—The principal adulterants or substitutes for uva ursi leaves are the leaves of the common box *Buxus sempervirens* L., and of the cow-berry (*Vaccinium vitis idaea*). In view of the modern practice to supply uva ursi in the cut-up form, Dr. Tunmann has subjected these leaves to chemical examination and has determined that besides arbutin, uva ursi contains a *glucosidal tannic acid* which permits the distinction of this drug from its adulterants by chemical means, recognizable even without the use of a lens. If sections of uva ursi, immaterially whether cross-wise or length-wise, are placed upon two slides laid on a white surface, and the one is treated with a drop of vanillin-hydrochloric acid, the other with a drop of freshly-prepared ferrous sulphate solution, the vanillin reagent produces a carmine-red color, while the ferrous sulphate colors the section black and the solution acquires a blue-black color. Neither of these reactions are manifested if a section of box-leaf is treated in the same way. On the other hand, a section of cow-berry leaf produces the carmine-red color with the vanillin-acid, but with

the ferrous sulphate it simply darkens, and the solution at most acquires a faint yellowish color. That these reactions are not due to the arbutin present in the uva ursi and cow-berry leaves, is shown by the fact that when the leaves of the huckleberry (*Vaccinium myrtillus*), which also contain arbutin, are treated in the same way, the section is scarcely colored by vanillin-acid, and though darkened by the ferrous sulphate, the latter solution is not colored at all.—Pharm. Ztg., li, No. 68 (1906), 757.

Uva Ursi.—*Micro-chemical Determination of Arbutin*.—According to Dr. Tunmann the distribution of arbutin in uva-ursi leaves, and its micro-chemical recognition, is readily determined by the aid of the color-reaction with nitric acid recently described by C. Reichard (see *Nitric Acid* under "Inorganic Chemistry"). The content of arbutin in these leaves is, however, so large, that it is advisable to immerse the sections of the leaves for a few moments in diluted sulphuric acid (1 : 5 or 1 : 3) before applying the concentrated nitric acid. A distinct yellow color is produced with as little as 0.0001 Gm. of pure arbutin. In this connection Dr. Tunmann has ascertained that the arbutin is absent in the epidermal cells, the wood of the bundles, in some of the thickened parenchyma cells of the principal nerves, and in the bast fibres; but it is distributed with tolerable regularity in the entire leaf-mesophyll, although contained only in the cell-content, in which it occurs in the form of yellow clots, while the cellular membrane remains colorless after diffusion following decay. The author, furthermore, finds that the cells containing the *glucosidal tannic acid* (see the preceding abstract), are the same as those giving the arbutin reaction.—Pharm. Centralh., xlvii, No. 46 (1906), 945.

COMPOSITÆ.

Flores Cinæ.—*Adulteration with Timothy Seed, etc.*—Dr. G. Weigel calls attention to a parcel of *santonica* recently offered which, while at the first glance of unexceptionable appearance, proved on nearer examination to be adulterated with foreign seeds, three of which were identified as timothy (*Phleum pratense*) pyrethrum (*Chrysanthemum Leucanthemum*) and white clover (*Trifolium repens*). Of these, timothy seed was present in the largest proportion (from 10 to 12 per cent.), which was readily separated by sifting. Owing to their specific weight these small white egg-shaped, somewhat pointed seeds, escape attention, since they sink to the bottom of the mixture of seeds when this is shaken. It is quite probable, however, that the adulteration is not purposely effected, but rather that it is the result of careless collection—the plants named being indigenous to and growing in the same localities as *Artemisia maritima*.—Pharm. Centralh., xlvii, No. 43 (1906), 891.

Senecio Jacobæa.—*Proximate Constituents*.—A. Altan has subjected the herb of *Senecio jacobæa* to proximate examination with the following re-

sults: 10.4 per cent. of a *glucoside*, composed of $C_6H_{12}O_6$; 2.5 per cent. of a green *volatile oil*, having the sp. gr. 0.95 and the composition $C_{14}H_{10}O$; 0.985 per cent. of a green fatty matter, having an aromatic odor; 0.88 per cent. of a fatty acid, having the composition $C_6H_8O_2$, and 4.8 per cent. of mineral substances, containing among others the phosphates and oxalates of calcium and manganese.—Pharm. Ztg., li, No. 63 (1906), 703; from Pharm. Post, 1906, No. 30.

VALERIANACEÆ.

Kansho-Ko—*An Odoriferous Chinese Drug*.—Y. Asahima has identified the Chinese drug, known as "kansho-ko" or simply "kansho," to be in all probability derived from *Nardostachys jatamansi*. It is composed of the long rootstock of the plant covered with the remains of leaves, and is valued both in China and Japan on account of its odorous properties. The author obtained from this drug about 1.9 per cent. of a green-yellow, pleasantly odorous volatile oil, which resinified easily on exposure to air, and contained a sesquiterpene boiling at 250° – $254^{\circ}C$.—Pharm. Ztg., lii (1907), No. 47, 489; from Journ. of Pharm. Soc. of Japan, April, 1907.

RUBIACEÆ.

Cinchona—*Simple and Rapid Method of Assay*.—Florence recommends the following simple method of assaying cinchona when extreme accuracy is not required. 12 Gm. of the finely powdered bark are shaken with 120 Gm. of the pure alcohol-free ether, 10 Cc. of 10 per cent. sodium hydroxide are added, and the mixture is frequently shaken during 1 hour. Then 10 Gm. of water are added, so that the powdered bark may separate as a coherent mass, whereupon the ether extraction is decanted and shaken with 20 to 30 Cc. of lime water to remove resinous constituents. Now decant 100 Gm. (or an aliquot portion) of the ether extraction into a glass-stoppered vessel, add 30 Cc. of water, allow $\frac{N}{10}$ ethereal solution of oxalic acid (freshly prepared by dissolving 0.63 Gm. crystallized oxalic acid in 100 Cc. of pure ether) to flow into the ethereal solution of alkaloid from a burette, as long as a precipitate is produced or until a drop of the aqueous layer reacts neutral with litmus. The number of Cc. of oxalic acid solution consumed, multiplied by 0.015, gives the amount of total alkaloid in 10 Gm. of bark (= 100 Gm. of ether extraction).

Under the conditions of this experiment, all of the cinchona alkaloids in the ether extraction form white precipitates which, with the exception of the quinine oxalate formed, are dissolved in the water provided for this purpose. The

Determination of Quinine is therefore simply effected by collecting the precipitate on a filter, washing it with water until lime water ceases to produce turbidity, then drying and weighing it. The quantity of quinine oxalate so ascertained, multiplied by 0.878, gives the amount of quinine in 10 Gm. of the sample (1 Gm. Quinine Oxalate = 0.878 Gm. Quinine).

The above-described method, with certain modifications which are described by the author in detail, is available also for the exact assay of cinchona bark.—Pharm. Ztg. li, No. 70 (1906,) 776; from Bull. des. sc. pharmacol., xiii, (1906), No. 7.

Coffee—Bacteriological Examination.—H. Kühl reports the results of bacteriological examinations of different sorts of coffee, which demonstrate the occurrence of a tolerably abundant distribution of fungus vegetation on raw coffee seeds. It is not evident, however, that the infested seeds can be regarded as carriers of pathogenic germs, or at all events not such as need be considered dangerous. The coffees examined were of Arabian, African, East Indian, and of North, Central and South American origin. No characteristic differences in the microscopic structure of the different seeds could be observed, but they all gave evidence of numerous bacteria on their surfaces.—Pharm. Ztg., li, No. 102 (1906), 1026.

Gambir—Commercial Quality.—Recent complaints concerning the quality of certain commercial specimens of gambir, induced Charles H. LaWall to undertake the investigation of a number of samples of the drug from various sources. The physical appearance of the samples varied greatly, some being in cubes, some in masses taken from the matts in which the drug is allowed to harden, and some of soft pasty consistency, in glass jars, mouldy and in bad condition. Of twelve samples examined, seven were fully up to the U. S. P. requirements (70 per cent. or more soluble in alcohol, not more than 5 per cent. of ash), and of the remaining five, three would be rejected by the most inexperienced person on account of inferiority of physical characters. The unfavorable reports concerning the quality of the gambir have probably originated in the confusion of samples which were intended for crude technical uses. If samples are purchased possessing the physical characteristics of light color and freedom from mouldiness there need be little fear of not obtaining a satisfactory article.—Amer. Jour. Pharm., May, 1907, 202-205.

Gambir—Not to be Confounded with Catechu.—John S. Bond, Sr., observes that the impression is widespread among both the medical and pharmaceutical professions that Tinct. Gambir Compositus is simply a new name for Tinc. Catechu Compositus, and that the article called Tinc. Gambir Co. is merely Tinc. Catechu Co. somewhat modified in strength. Pharmacists should remember that gambir is an extract from the leaves and twigs of one plant, while catechu is an extract from the wood of another plant, both of which are rich in tannic acid. Catechu is a much cruder article than gambir, and is used chiefly for tanning purposes. The author therefore warns druggists not to make tinc. gambir comp. from catechu, but to procure the U. S. P. article, gambir, if they desire to fill the orders of particular physicians.—Nat. Drugg., Sept., 1906, 288.

CAPRIFOLIACEÆ.

Viburnum Tinus—*Presence of a Glucoside Yielding Valerianic Acid.*—E. Danjou has demonstrated by means of the biological method the presence of a glucoside in *Viburnum tinus*, which, when hydrolyzed with emulsin, furnishes valerianic acid.—Pharm. Journ., Mar. 9, 1907, 293; from Jour. de Pharm. et Chim., 24 (1906), 575.

UMBELLIFERÆ.

Clarettaresion—*An Umbelliferous Resin Resembling Colophonium.*—Dr. Karl Dieterich calls attention to a new resin from Chili, which is derived from an umbelliferous plant,

Azorella compacta, and has been offered as a substitute for colophonium. It has a dark color, an aromatic, pungent and acid odor, and is evidently a very impure product, containing up to 9 per cent. of vegetable particles, losing from 16 to 19 per cent. of its weight at 100° C., and yielding 2 to 3 per cent. of ash. While possessing excellent adhesive qualities and other properties similar to turpentine resin, it contains too many impurities to commend it as a substitute for the latter in pharmacy; nor is it likely to find favor for technical purposes, since it does not yield the valuable resin oils obtainable from colophonium. Pharmacognostically, however, it is interesting, because, unlike other umbelliferous exudations, it contains no gum, and because, while in distinction from turpentine resin it contains both esters and saponifiable constituents, it corresponds well with the latter in regard to melting-point, specific gravity, and in the Storch-Morawski reaction.—Pharm. Ztg., li, No. 76 (1906), 840.

ARALIACEÆ.

Ginseng—*Saponin-like Constituent.*—Y. Asahima, Yakugakushi, and B. Taguchi have obtained from ginseng of Japanese commerce, by the baryta method, a kind of saponin, which apparently differs in important particulars from the constituent of indigenous and Korean ginsengs recently isolated and described by Fuzitani under the name of "panaquillon." In fact its chemical behavior is quite analogous to ordinary saponin, destroying erythrocytes and failing to evolve carbon dioxide when acted upon by mineral acids—the contrary being attributed by Fuzitani to his panaquillon.—Pharm. Ztg., li, No. 63 (1906), 703; from Journ. Pharm. Soc. of Japan, 1906, 549.

Ginseng—*Adulterants.*—Continuing their researches on ginseng P. Hurrier and E. Perot describe the characters of the following drugs which they have found admixed with or substituted for ginseng:—(1) Root of *Panax sessileflorum*, Panch.; (2) Root of *Campanula glauca*, Thunb.; (3) Root of *Platycodon grandiflorum*, Benth., Hook.; (4) Root of *Adenophora verticillata*, Fisch.; (5) Root of *Sophora angustifolia*, Seib.

et Zucc. ; (6) Root of *Angelica polyclada*, Franch. ; (7) Root of *Rehmannia chinensis*, Lib. ; (8) Rhizome of *Apocynum juvenas*, Loureiro ; (9) Rhizome of *Dioscorea sativa*, L. ; (10) Rhizome of *Ophiopogon japonicus*, Ker Gawl. A description of each of these substitutes including the histology is given for details of which reference should be made to the original.—Pharm. Journ., Feb. 2, 1907, 107 ; from Bull. des Sci. Pharm. 13, 659.

RANUNCULACEÆ.

Aconite—*Alkaloid-Content in the "Daughter" Tubers*.—F. Wentrup has experimented to determine definitely the question whether the medicinal use of the "daughter" tubers along with the parent aconite tubers, which is permitted by the G. P., is justified, and finds that the daughter tubers contain even a little more alkaloid than the parent tubers. Unfortunately the tubers available were all deficient in alkaloid, yielding only from 0.34 to 0.52 per cent., whereas Keller in his examinations had obtained from 0.87 to 1.23 per cent., and the experiments must therefore be repeated with other, and particularly fresh, material in order to definitely determine whether material differences exists in the content of tubers richer in alkaloid.—Pharm. Ztg., li, 63 (1906), 703 ; from Journ. d. Pharm. v. Els.-Lothr., No. 7, 1906.

Aconitum Uncinatum L.—*Morphological Characteristics*.—Theo. Holm gives an elaborate description of the morphological and anatomical structure of *Aconitum uncinatum* L. with the object of directing attention to certain characteristics which may prove useful in distinguishing the plant when represented in shape of a "drug," his text being illustrated by numerous cuts showing the plant, inflorescence, fruit, leaf and underground portions, as well as the microscopic characteristics revealed by sections of the same. The results of his observations are summarized by the author as follows : *Aconitum uncinatum* L. represents an excellent example of the anomalous structure possessed by some of the *Ranunculaceæ*, and should be readily recognized by means of the various points which have been described and explained. Thus, characteristic of the leaf-blade is the structure of the stomata, surrounded by ordinary epidermis cells ; the high development of the palisade and the pneumatic tissue ; absence of stereome, and, finally, the midrib being composed of one large and two minute mestome bundles. The structure of the stem above ground is also very distinct on account of the broad zone of stereomatic tissue surrounding the isolated mestome strands, besides on account of the lack of a stele. In the stem underground, the stolon, the fibro-vascular system appears, on the other hand, as two typical steles. Finally, the rhizome, with the development of a tuberous root beneath the apical bud of the stolon, is readily distinguished from most other rhizomes, but resembles that of certain *Orchideæ*.—Merck's Rep., March, 1907, 65-67.

BERBERIDACEÆ.

Achlys Triphylla—*Coumarin a Constituent*.—C. E. Bradley calls attention to *Achlys triphylla*, a plant occurring plentifully in the fir forests of the Pacific coast from British Columbia to California, where it is known as "elkweed," and also as "wild vanilla" on account of the odor it acquires on drying. This is due to the formation of coumarin, of which the dried plant yields 0.2 per cent.—Journ. Amer. Chem. Soc., 29 (1907), 606.

Caulophyllum Thalictroides (L.) Michx.—*Botanical Classification*.—In an elaborate description of the botanical and structural characteristics of *Caulophyllum thalictroides*, illustrated by a large number of figures drawn from nature, Theo. Holm calls attention to certain characteristics—botanical and structural—which seem to justify its classification as the type of a distinct genus, as has been proposed by Bentham and Hooker. While these authors regard the species *Caulophyllum* and *Leontice* as belonging to two distinct genera, Prantl declines to recognize *Caulophyllum* as a distinct genus, and places it as a section of the genus *Leontice*—a suggestion which has been followed by several recent authors. On the other hand, Citerne, who likewise has treated the family of the *Berberidaceæ* from an organographic point of view, reaches the same conclusions as Bentham and Hooker, and keeps both as separate genera. He points out the very notable difference between these in regard to the structure of the rhizome and of the pericarp; and while these facts are probably not sufficient for their segregation, Mr. Holm thinks that these differences, combined with the fact that *Caulophyllum* is the only member of the *Berberidaceæ* that possesses secretory ducts, are sufficient distinctions to justify its classification as a genus.—Merck's Rep., April, 1907, 94-96.

Jeffersonia Diphylla (L.) Pers.—*Botanical and Anatomical Characteristics*.—Theo. Holm, in continuation of a series of elaborate descriptions of certain medicinal plants of North America, describes the botanical and anatomical characteristics of *Jeffersonia diphylla* (L.) Pers. Among the anatomical characters which seem to be well marked and characteristic of this plant the author enumerates the following: The presence of hyphæ in some of the roots; the lack of an endodermis in the scape and rhizome; the presence of parenchyma-sheaths in the smaller veins of the leaf blade; the structure of the larger veins, being composed of two distinct mestome-strands. The text of this interesting paper, which must be consulted in the original, is illustrated by numerous figures drawn from nature by the author.—Merck's Rep., May, 1907, 125-127.

Nandina Domestica Th.—*Hydrocyanic Acid in Several Varieties*.—In the course of investigation concerning the distribution of tannins in different natural orders of plants, J. Dekker had also included *Nandina domestica* Th. It is interesting to note that the fresh leaves of the white-fruited variety, a native of China and Japan, cultivated in the botanic gardens of

Leiden, yielded on distillation 0.12 per cent. of hydrocyanic acid, and that acetone could also be determined in the filtrate from the silver cyanide precipitate. Hydrocyanic acid was also found in the red-fruited variety of the plant (0.147 per cent.), in *N. domestica* var. *major* (0.074 per cent.) and in *N. domestica* var. *angustifolia* (0.07 per cent.).—Apoth. Ztg., xx (1906), No. 79, 848; from Pharm. Weekbl., 1906, No. 37.

MENISPERMACEÆ.

Calumba Root—Alkaloidal Constituents.—At the recent meeting of German Naturalists and Physicians in Stuttgart (September, 1906), Dr. J. Gadamer reviewed the results of an investigation into the nature of the alkaloidal constituents of calumba root, undertaken and carried out at his suggestion by Dr. K. Feist, from which it appears that this root contains, besides some amorphous alkaloids, two alkaloids in larger, and a third alkaloid in very small quantities. These alkaloids are obtained by extracting calumba root with alcohol, solution of the extract in water, removal of mucilaginous substances by a special process, and precipitation of the alkaloids with potassium iodide. A mixture of alkaloidal iodides is thus obtained, which may be separated by a rather tedious process, by means of alcohol. These several alkaloids, for convenience, are designated by the letters A, B and C, but have been named respectively:

A=Columbamine ($C_{21}H_{22}NO_5.OH$).

B=Jateorrhizine ($C_{20}H_{20}NO_5.OH$).

C=Palmitine ($C_{22}H_{24}NO_6.OH$).?

This forms a homologous series, in which *C=Palmitine* stands at the head, if the formula for this alkaloid, which has not yet been positively determined, can be accepted as correct—the formula for *A=Columbamine* having been confidently determined by the investigations of Günzel, while that for *B=Jateorrhizine* has been determined with equal confidence by Feist. On treating the before-mentioned mixture of alkaloids with alcohol, the amorphous alkaloids and alkaloid *B* are readily dissolved, leaving the alkaloid *A* undissolved, this latter also retaining the alkaloid *C*, which occurs in very small quantities and has proved to be the least soluble of the three alkaloids. Dr. Feist's investigations include a study of the chemical constitution of the several alkaloids, and are particularly interesting in pointing out their constitutional relation to *Berberine*, at one time considered to be a constituent of calumba, proven by Gordin not to be such.—Pharm. Ztg., li, No. 76 (1906), 837–838.

Calumba—Distribution of Calcium Oxalate in the Root.—Contrary to the statement in text-books, which is accepted also in the G. P., that oxalate crystals are found only in the stone cells of the outer bark of calumba root, Dr. Tunmann finds that calcium oxalate crystals are found not alone in all parts of the bark but throughout the entire woody portion of the

root. These crystals are, however, not prominently visible, being obscured by the starch-content, so that even in clarified sections they may escape notice in the large cells of the parenchyme. If, on the other hand, the section be touched with moderately dilute sulphuric acid, the entire section in a short time becomes coated with the characteristic crystals of gypsum. The crystals which Bödeker regarded as being *columbin* are believed by Tunmann to be in reality oxalate crystals and prisms, which are frequently found in large quantities in the inner bark in the vicinity of the cambium.—Pharm. Centralh., xlvii, No. 52 (1906), 1069.

Cyclea Peltata—*Alkaloidal Constituent*.—A. Sutterheim has subjected *Cyclea peltata* H. and Th. to proximate examination, and finds the most important constituent to be an alkaloid which he has named

Cycleine. It is obtained by extraction with hydrous ether, the impurities remaining in the water, which separates and permits the yellow ether solution to be decanted. The ether being evaporated, the residue is recrystallized from acetone, from which it crystallizes in form of silky needles (m. p. 145° C.), retaining 1 mol. of acetone. This it loses on heating the crystals at 95° C. for two hours, the melting-point rising to 214° C. Cycleine has the composition corresponding to the formula $C_{27}H_{31}N_2O_4$. It is dissolved by concentrated sulphuric acid with a light yellow color, changing to wine-red on heating. The addition of concentrated nitric acid to a solution of the alkaloid in diluted nitric acid produces an orange-yellow precipitate, which is soluble with an orange-red color when more acid is added. Pharmacologically it has the effect of a cardiac poison, accompanied by action on the respiratory centers.—Pharm. Ztg., li, No. 68 (1906), 758; from Pharm. Weekbl., 1906, No. 32.

SIMARUBACEÆ.

Kirondro Poison—*Botanical Source*.—Baillon has heretofore referred the "kirondo" tree of Madagascar, which is regarded as yielding a violent poison, to *Dallbergia toxicaria*, and the Rev. R. P. Baron described it as a leguminosa. Professor M. L. Courchet has now, however, received specimens collected on the sandy hills of Ambongo in N. W. Madagascar, collected by Mr. Perrier, which show conclusively that the tree must be referred to the simarubacea. Kirondro appears to have been confounded hitherto with kitsongo, a plant occurring in the same district, which is referable to leguminosæ. Mr. Courchet gives excellent illustrations of the plant. It is allied to *Picrasma*, but differs in having twice as many stamens as petals, in its embryo having a deeply ruminant surface, and in the presence of mucilaginous lacunæ in all the vegetative organs. Mr. Courchet has, therefore, placed it in a new genus, *Perriera*, under the name of *P. madagascariensis*. The fruits are indehiscent and of the size of a small hen's-egg and somewhat plano-convex. The taste of the seeds

and leaves, etc., is very bitter.—Pharm. Journ., Oct. 27, 1906, 463; from Ann. de l'Institut. Colon. de Marseille, 1905, 195-247.

Napawsaw.—*An East Indian Drug having Valuable Tonic Properties*.—David Hooper directs attention to a valuable tonic bark derived from *Picrasma javanica* Bl., a large tree, 80 to 100 ft. high, and about 6 ft. in diameter. The tree is said to be common in the Ataran Forest Division, Tenasserim, Burma, where it is called by the Karen name *Napawsaw*. The bark is exceedingly bitter, and is used by Karens as a febrifuge instead of quinine. The bark contains a bitter principle allied to, if not identical with quassia, and has an advantage over cinchona bark in not containing tannin. There is no alkaloidal principle as quinine in the bark. The drug might have a more extended use as a tonic in place of quassia.—Pharm. Journ., Sept. 1, 1906, 258.

False Jaborandi—Occurrence in the French Market.—Dr. G. Weigel calls attention to a jaborandi substitute that has recently appeared in the Marseilles market, which bears in its external appearance (form, color and leathery texture) sufficient resemblance to the genuine leaves of *Pilocarpus pennatifolius* to be mistaken for them on superficial examination. Nearer examination, however, reveals the absence of characteristic features, such as the prominently notched points of the leaves and of the numerous red-brown secretory-vessels, which are so evident in the genuine leaves that when such a leaf is held against the light it has the appearance of being punctured with numerous holes. The chemical examination for alkaloid also gave negative results. The odor, also, is quite distinct from that of genuine jaborandi leaves. When a leaf of the false jaborandi is crushed and rubbed between the fingers, the aroma developed reminds of clover and cinnamon, somewhat like that of the oil of cinnamon leaves. The same false leaves appear also to have been offered at other points under the designation of "Feuilles de Bois d' Inde," which would seem to indicate that the false drug is derived from *Hamatoxylon Campechianum* L., since the term "Bois d' Inde" is applied in France to logwood, which is the heartwood of that plant.—Pharm. Centralh., xlvii, No. 43 (1906), 891.

Maracaibo Simaruba Bark—Macroscopic and Microscopic Distinctions from the Orinoco Drug.—According to Gehe & Co. a simaruba bark from Maracaibo has for some time reached the European markets in place of the drug heretofore exported from Ciudad Bolivar on the Orinoco. The new bark has been subjected to macroscopic and microscopic examination by L. Rosenthaler and P. Stadler, who find it to exhibit variations from the genuine bark which permit its distinction and recognition without difficulty. The root bark of the genuine variety is almost completely free of starch. It is richer in parenchymatous elements and particularly so in bast fibers. These form large bundles, arranged in radial and frequently also in tangential rows. On the other hand it contains less of the oxalate

cells accompanying the medullary rays of the Maracaibo bark and is also poorer in stone cell aggregations. The taste of both barks is strong and pure bitter, while their anatomical structure exhibits so much that is identical that a close relationship doubtless exists between them.—Pharm. Ztg., lii, No. 38 (1907), 393; from Ber. d. D. Pharm. Ger., No. 3, 1907.

LINACEÆ.

Linseed—Characters and Localization of Starch.—In view of the conflicting statements concerning the occurrence of starch in linseed, Dr. P. Schürhoff has subjected these seeds to examination. He finds starch to be an integral constituent of linseed, and that it occurs in large quantities in the parenchymatous layer of the seed coat, which is situated between the mucilage-epiderm and the scleride layer. The starch is roundish-oval in shape, and the granules are mostly of the same size, the largest having a diameter of 0.04 Mm.—Pharm. Ztg., li, No. 59 (1906), 658.

Linseed—Occurrence of Starch Exceptional.—Referring to the above observation of Schürhoff that starch is an integral constituent of linseed, Dr. Tunmann expresses the belief that the presence of starch in *ripe* linseed should be regarded as exceptional, since starch is the normal constituent of only one variety of linseed, namely, the seed of *Linum crepitans* Bönng., which is not regularly used for preparing linseed meal. The starch may, however, be due to the presence of large quantities of *unripe* linseeds, or to that of foreign seeds containing starch. The presence of large quantities of unripe seeds is explained by the fact that in order to secure a good linen fibre it is customary to harvest the plant before the perfect maturity of the seed.—Pharm. Centralh., xlvii, No. 36 (1906), 725.

STERCULIACEÆ.

"Laboshi" Cola Nuts—Botanical Source.—According to Dr. O. Stapf, the "Laboshi" or "Labogie" cola nuts of the province of Nupé in North Nigeria are obtained from *Cola acuminata*, Schott. and Endl. It has only two cotyledons, and fetches nearly double the price of the kind with four or five cotyledons. Dr. Stapf considers that this is the species to which the name of *Cola acuminata* properly belongs, and that Schumann was in error when he gave the name of *Cola vera* to the plant having seeds with two cotyledons. It appears that cola trees commence to fruit when six or seven years old, and the mature tree yields forty to fifty fruits. The fruits are stored in the shade or they turn black. The seeds are not easily skinned at first, but after storing for a short time the skin is easily removed by the fingers. If the harvest exceeds the demand the surplus is packed in the leaves of *Thaumatococcus Danielli*, Benth. (*Phrynium Danielli*, Benn.), and stored in palm leaf baskets. The seeds are principally exported by sea to Lagos, but twice as much is sent to the hinterlands.—Pharm. Journ., July, 1906, 106; from Bull. Kew Gar., No. 4, 1906, 99.

Cola Nuts—Preservation with Sugar.—In view of the recent recommendations, by Goris, Arnould and others, to preserve cola nuts by sterilization, either dry or by the aid of alcohol, P. Carles again calls attention to the efficiency of sugar as a preservative by a method which he proposed a number of years ago, and which secures the physiologically valuable constituents of the drug (the albuminoids, and in particular the oxydase) in an unchanged and active condition for years. For this purpose the fresh cola nuts are converted, by mechanical means and without heat with an equal weight of sugar, into a marmelade, which is then enclosed in securely-stoppered containers. This mixture, after keeping for years protected from the air, remains unchanged in color, but after exposure for about three days acquires the well-known red color, due to the action of the oxydase, which manifests itself, indeed, immediately if the mixture is stirred up with water.—Pharm. Ztg., lii (1907), No. 47, 489; from Rép. de Pharm., 1907, No. 5.

Cola Nuts—Dry Preparation retaining the Unchanged Constituents of the Fresh Seeds.—While dried cola nuts contain caffeine as essential constituent, the fresh drug contains this base in combination with tannic acid and glucose tannic acid, which combinations are destroyed by the oxidizing effect of air with formation of cola-red. In consequence, the dried drug simply possesses the pharmacological action of caffeine. J. Chevrotier and P. Vigne have now succeeded by a process in which air is carefully excluded to obtain a dry preparation, having a white color, in which the caffeine is contained in its unchanged original combination, and so keeps indefinitely if mixed with sugar. In accordance with this, its pharmacologic activity also differs from that of the cola preparations heretofore supplied, and is identical with that manifested by fresh cola nuts.—Pharm. Ztg., lii (1907) No. 5, 48; from Bull. des Scienc. Pharm., Nov. 1906.

TILLIACEÆ.

Jute Seeds—Glucosidal Constituent.—R. Kobert has isolated from the seeds of certain jute plants a glucoside,

Corchorin, which possesses powerful pharmacologic and toxic properties resembling those of the digitalin group and approaching most nearly those of andromedotoxin. The glucoside is, however, not a constituent of the seeds from all the varieties of jute plants, being found only, so far as the present experiments reveal, in the seeds of *Corchorus capsularis*, *C. bengalensis*, *C. acutangulus*, *C. argutus* and *C. trilocularis*. The glucoside, which was previously indicated as a constituent of jute seeds by the investigations of Tsuno, is now described as an excessively bitter substance, readily soluble in water and in alcohol, but nearly insoluble in ether, chloroform and benzol.—Pharm. Ztg., lii (1907), No. 20, 202; from Ber. d. Naturforsch. Ges., Rostock, 1906, No. 5.

GUTTIFERÆ.

Garcinia Cochinchinensis, Choisy.—*Structural Peculiarities Characteristic of the Genus*.—Theo. Holm has had opportunity to study the germination of *Garcinia cochinchinensis*, as well as the morphology of the vegetable organs of the plant, and reports his observations in an elaborate paper illustrated with eight figures drawn from nature. Among the structural peculiarities that appear to be characteristic of *Garcinia* in general may be mentioned the structure of the stomata, with their subsidiary cells; the very conspicuous resiniferous ducts; the presence of oily substances in the cells of the cortex and mesophyll; the structure of the larger veins in the leaves, with their double mestome strands; the complete absence of glandular hairs; and, finally, the almost unique development, noticeable in the seedlings, of the hypocotyl and the root system.—Merck's Rep., Jan., 1907, 1-4.

POLYGALACÆ.

Polygala Senega L.—*Anatomical Characteristics*.—Theo. Holm gives an excellent description of the anatomical character exhibited by *Polygala Senega*, which he briefly summarizes as follows: The peculiar hairs, observed on the stem and leaves; the lack of collenchyma in the stem; the presence of an endodermis and stereomatic sheath in the stem; the dorsiventral leaf with the stomata surrounded by ordinary epidermis-cells; the parenchyma-sheath around the smaller veins; the presence of collenchyma but lack of stereome in the leaves, and finally the irregular eccentric development of the secondary tissues in the roots. The text of the author's paper is illustrated by numerous drawings exhibiting the characteristics mentioned.—Merck's Rep., June, 1907, 155-157.

FUMARIACÆ.

Corydalis Cava—*Presence of Protopine in Chinese and Japanese Tubers*.—Dr. Ernest Schmidt observes that heretofore *protopine*, the characteristic alkaloid of the *Papaveraceæ*, had not been determined as a constituent of *Corydalis cava*, either in the tubers or the leaves of the plant, but that recently Dr. Makoshi has succeeded in isolating this base, in considerable quantities, from corydalis tubers of Chinese as well as of Japanese origin. The Chinese corydalis tubers are characterized and differentiated from the European tubers of *Corydalis cava* by their yellow color and horn-like texture, as well as the relative proportions of the alkaloids contained in them. Of the principal alkaloids found in European tubers corydaline and bulbocapnine, only small quantities were obtainable, whereas besides protopine and other alkaloids an abundance of bases of an intense yellow color were obtainable from the Chinese drug. These bases, in their physical and general characters, show great resemblance to berberine and its derivatives, but are nevertheless not related to the latter,

consisting apparently of dehydroderivatives of corydaline. The intensely yellow hydrochlorides of these bases, which have the character of quaternary ammonium hydrochloride, are reducible by means of zinc and hydrochloric acid into a colorless alkaloid, melting at 135° – 136° C., and possessing characters and properties corresponding to optically inactive corydaline.—Pharm. Ztg., li, No. 77 (1906), 849.

PAPAVERACEÆ.

Poppy Capsules—Morphine Content.—Experiments made by A. Malin-Punkaloidun confirm the presence of morphine in ripe poppy capsules, which has heretofore been disputed. He found in completely ripe capsules 0.018 per cent. of morphine and 0.028 per cent. of narcotine and codeine. Unripe capsules, on the other hand, contained from 0.02 to 0.05 per cent. of morphine, but only from 0.0113 to 0.0116 per cent. of narcotine and codeine. While, therefore, the morphine content of poppy capsules is diminished, the narcotine and codeine are increased as the fruit matures.—Pharm. Ztg., lii, No. 14 (1907), 137; from Ber. d. D. Pharm. Ges., No. 1, 1907.

Anti-Opium Remedies.—See *Combretum Sundaicum* under “Combretaceæ.”

Opium—Commercial Varieties.—C. M. Kline contributes some notes on opium from the commercial standpoint, in which appears some interesting information concerning the different commercial varieties not usually found in text books. Under the main divisions we have Turkey opium, which includes the product of Asia Minor and European Turkey, Persian opium, East India opium, Egyptian opium, Chinese opium; other opiums, such as Bulgarian, Zambesi, Mozambique, etc., are produced only in small quantities, and need no consideration in this connection. The opium produced in Turkey is the most important commercially and medicinally, and is beyond all comparison the most widely known in the markets of the world. Five-eighths of this opium is marketed through Smyrna, the remainder through Constantinople and Salonica. The principal commercial varieties of Turkey opium are as follows:

Boghaditz, the richest opium obtainable in Asia Minor, derives its name from the district lying north of Smyrna to Constantinople.

Yerli, meaning “surrounding,” indicates all opium from the districts surrounding Smyrna except Boghaditz. This opium is rich in morphine, but very soft and poor in appearance.

Karahissar, a grade derived from the territory lying next beyond the district known as Yerli and further away from Smyrna, with the town of Karahissar as its center. This opium is generally slightly; some more so, some less. The poorer grades are shipped as jobbing opium, the higher as “selected Karahissar.” The average morphine content of the better grades is said to be about 11.5 to 12 per cent.

Adet, meaning "common," is the opium sometimes called "Jobbing Opium," and originally described the opium of inferior grades from all districts.

Salonica. This includes all opium produced in European Turkey and marketed through the port of Salonica. Formerly it was of very fine quality, assaying as high as 14 per cent., but not much of it was produced; now Salonica markets about one-third the total opium in Turkey, but the quality is somewhat poor, some shipments testing as low as 10 per cent.

Tokat and Malatia. These are opiums produced in the Armenian districts of the same name, and are sold in the Constantinople market for export to Cuba, West Indies and South America. They are largely of a light color, and fine, smooth texture, but their morphine content is stated to vary from 7 to 14 per cent.

Persian Opium only appears occasionally in the United States, when the crop is large and the price reasonable enough to warrant its use in manufacturing. When the crop is small and the price high, it finds its way to the Chinese market, being valued for smoking. Its morphine content runs from 12 to 14 per cent.

Egyptian Opium, is only produced in small quantity. It is of a dark color, has a low morphine content (6 to 7 per cent.), and only occasionally appears on the market.

India Opium is marketed almost entirely in China and is never seen in Western markets. Its morphine content is said to be about 7 per cent.—*Amer. Journ. Pharm.*, April, 1907, 156-160.

Opium—Modification of Leger's Method of Morphimetric Assay.—1. Picard suggests the following modification of Leger's method for the assay of opium: Six Gm. of opium in No. 120 powder, dried at 60° C., are rubbed down with a very little lime water to make a soft mass, which is thoroughly worked. The remainder of 48 Cc. of lime water is then added so as to form a homogeneous mixture, which is carefully covered and set aside for two hours. Fifty Cc. of 5 per cent. solution of sodium salicylate is then mixed in, and after ten minutes' contact the mixture is thrown on a cloth and strained with expression. The strained liquid is then filtered through a small filter into a small flask graduated at 36 Cc. and to that volume of filtrate 4 Cc. of pure ether is added. The liquid is then neutralized with dilute solution of ammonia, added drop by drop, and tested after each addition with litmus paper. When neutral, six drops in excess are added, the flask is corked, shaken for ten minutes and set aside for twenty-four hours. The liquid is then passed through two counterpoised filters, any adhering crystals of morphine being washed off the flask on to the filter with 8 Cc. of water. The beak of the funnel is then closed with a piece of India rubber tubing carrying a pinch-cock. The filter and funnel are then filled with distilled water to which a few drops of pure

ether have been added. After five minutes' contact this water is run off and the washing repeated a second time in the same manner. The precipitate is then drained, dried at 100°C ., and weighed. If desired the dry precipitate may be washed with 20 Cc. of benzine and again dried and weighed. This may remove a trace of narcotine, but in the author's opinion it is not necessary.—Pharm. Journ., Jan. 19, 1907, 59; from Bull. Soc. Pharm. de Bordeaux, 1906, 46, 250.

Opium—Novel Process of Morphimetric Assay.—Thomas Tickle describes a new process for the morphimetric assay of opium, the essential point of which consists in the employment of meta-cresol as a solvent of the alkaloid. In contact with a concentrated solution of morphine, cresol readily dissolves the liberated alkaloid up to a strength of 40 per cent., whilst amyl alcohol dissolves only 5 Mgm. per Cc. In very weak solutions, however, the cresol only takes up about twice as much as amyl alcohol, a fact due to the aqueous layer being saturated with cresol, and, therefore, a stronger solvent than water alone. But this intermiscibility of solvent and water is diminished by the admixture of some other solvent, notably amyl alcohol. The general process outlined by the author for the isolation of morphine consists in liberating the alkaloid contained in 100 Cc. of solution with sodium bicarbonate, agitating with a mixture of pure or recently distilled cresol (2 parts) and amyl alcohol (1 part) in four separate fractions. The mixed fractions, totalling 30 Cc., are next treated with 15 Cc. of ether, which has the curious property of annulling all tendency of the solvent to retain alkaloid; then 30 Cc. of petroleum ether is added to further facilitate the extraction by diluted acetic acid. Ten Cc. of 1 per cent. acetic acid are used for the first shaking out of the morphine, and 5 Cc. for succeeding extractions until exhausted. The solution of morphine acetate thus obtained is evaporated to dryness, taken up with water and placed in a covered vessel side by side with an open beaker containing very dilute ammonia. The morphine solution rapidly absorbs ammonia vapor and deposits the alkaloid in a crystalline state. By this ingenious procedure there is no danger of introducing excess of ammonia in which the alkaloid is more soluble than in water. The crystals thus obtained are dried at 110°C . and weighed.—Pharm. Journ., Febr. 16, 1907, 162-164.

Opium—Advantages of the B. P. Lime Process of Assay.—In a comprehensive note on the official process for the determination of morphine in opium and tincture of opium, F. H. Farr and R. Wright conclude that the lime process of the B. P. is for all practical purposes the best available. It has the advantage of yielding the morphine in a comparatively pure state and gives remarkably concordant results. While a shaking out process with a solvent such as amyl alcohol might be considered preferable in so far as time required for the assay is concerned, there is not much fault to find even on that score. The authors point out some weak points, how-

ever, which should be eliminated in the next edition of the B. P., among which they mention particularly the use of too much filtrate for the final assay.—Pharm. Journ.

Opium Assay—Modification of the Official Directions.—Leo Eliel finds that if the U. S. P. process for the assay of opium is closely adhered to, there will be several opportunities for serious error. In the extraction of the 10 Gm. of opium required for the assay, the amount of the filtrate is limited to 300 Cc.; he suggests to obtain the filtrate in successive fractions of 50, 150 and 100 Cc. The shaking out of the opium should be conducted in a glass-stoppered flask, as should be the subsequent shaking of the concentrated filtrate with the alcohol, ether and ammonia. The use of a cork-stopper, however sound the cork may be, is liable to cause a loss of morphine by absorption and adherence. The weighing of the morphine should be effected without removing it from the filter, the inner filter, containing the morphine, being counterpoised carefully with the outer before placing the two filters in the funnel, as now directed.—Proc. Indiana Pharm. Assoc., 1906, 195.

Opium Assay—Criticism of the B. P. Method.—D. B. Dott discussing the B. P. method of opium assay observes that while the process has been highly commended for constancy of results, and is superior in this respect to the other alkaloidal processes of estimation in the B. P., it by no means follows that the results are uniformly quite true, nor that the degree of error is always the same, notwithstanding that it leaves little to desire on the side of consistency of results when applied to the same sample. In these respects it differs notably from the older time processes of the B. P., and of the U. S. P., which were conspicuous for their discrepant results. But a process which is not quite satisfactory from a strictly scientific or even commercial point of view may be sufficiently accurate for the assay of pharmaceutical preparations. The official opium process is readily carried out, does not require a great amount of experience or skill, gives concordant results, and is probably sufficiently near the truth for dosage purposes. One can, therefore, quite understand that it may not be proposed to alter the process materially in the next British Pharmacopœia. At the same time, it seems desirable that any undoubted defects should be remedied. The official opium preparations are in the exceptional position that a distinctly different method is applied to the liquid preparations from that applied to the powder and extract. In the former case a mixture of solution and lime is made up to a definite volume, in the latter case a definite amount of water and of lime is added to the weighed quantity of opium. This difference would be of little importance if the methods had been properly adjusted to the same standard, but that is not so. The proportions employed for the tincture and liquid extract give a result under the truth (as pointed out by Dowzard), while the pro-

portions taken for the powder and solid extract give a high result, as shown by the author, and in these respects the present assay process should be corrected.—Pharm. Journ., Jan. 26, 1907, 78.

CRUCIFERÆ.

Radishes—Presence of an Amylolytic Enzyme in the Juice.—T. Saiki finds that the filtered and dialyzed juice of the common radish possesses a marked hydrolyzing action on starch. The sugar produced by its action has been identified as maltose. The ferment has been precipitated and obtained as a powder. Radish juice contains no proteolytic ferment, since it has no action on fibrin or albumin in either acid or alkaline media.—Pharm. Journ., Mar. 9, 1907, 293; from Journ. de Pharm. et Chim., 24 (1906), 561.

FLACCURTIANÆ.

Gum of Cochlospermum Gossypium—An East Indian Substitute for Tragacanth.—H. H. Robinson has made a chemical investigation into the nature of the gum yielded by *Cochlospermum gossypium*, sold in the Indian bazars as a substitute for tragacanth, which it resembles in that it absorbs a large quantity of water and swells up to many times its original size. The gum has the remarkable property, also possessed by the gum of *Sterculia urens*, of slowly giving off acetic acid when exposed to moist air. It is free from starch, and yields a stable and probably dibasic acid, $C_{23}H_{36}O_{21}$, for which the name of gondic acid is proposed. The yield of acetic acid was 14 per cent. of the gum, or 18 per cent. calculated on the dry and ash-free substance. By the action of sodium hydroxide solution in the cold, the acetyl group was removed and a gummy substance, which had acid properties, was obtained. For this the name of *α*-cochlosperminic acid is suggested. As a result of his experiments the author thinks it possible that the gum is itself a tetra-acetyl derivative of *α*-cochlosperminic acid, which may be a hexosan-xylosan-gondic acid, $C_6H_{10}O_5$, $C_5H_8O_4$, $C_{23}H_{36}O_{21}$, or $C_{34}H_{54}O_{30}$. It was noticed that like the arabinic acid prepared from gum arabic, gondic acid is rendered less easily soluble in water by prolonged drying at 100°C. From the liquids from which the gum acids had been precipitated by alcohol, two sugars were isolated with considerable difficulty. The first sugar appeared to be a hexose; it may be a new sugar, or may be galactose not quite free from impurities. The other sugar is doubtless xylose.—Pharm. Journ., Dec. 8, 1906, 627; from Journ. Chem. Soc., 1906, 89, 1496.

• CACTACÆÆ.

Cactus Grandiflorus—Examination.—L. E. Sayre communicates the results of a microscopical examination of the stem of *Cactus grandiflorus*, made by his associate, Mr. Charles Sterling, which must be consulted in the original. In the course of this examination it was found extremely

difficult to obtain sections, on account of the softness of the tissue, which is loaded with water and mucilage. In order to arrive at some knowledge of the proportion of water in the fresh drug, several portions of the fresh, sliced drug were placed in a drying oven, kept at a temperature of 100° C., and dried to constant weight. The average loss of moisture was 95.25 per cent. The watery juice has an acid reaction to litmus. It evidently contains an inorganic crystalline compound, probably largely composed of potassium salt. A nitrogen determination of the dried and powdered stem, showed an amount indicating 13.312 per cent. of protein, or about the percentage contained in the ordinary food cereals. The ash amounted to 1.46 per cent. of the dry substance, about 60 per cent. being soluble in water. As to the question whether the drug should be made official in the U. S. Pharmacopœia, there are several reasons why this should be answered in the negative. Among the objections are the uncertainty as to the supply, the difficulty of identifying material, and the fact that the fresh material deteriorates very rapidly. The fresh turgid stems soon soften, and the mucilaginous material decomposes. Even the partially dried stems are quite unstable. If the fresh, reliable cactus were easily obtainable, a tincture from it could not be prepared, of the proper strength, using the general official formula for the tincture of fresh herbs. The proportion of cactus to that of alcohol would have to be much greater than 50 per cent.—Drugg. Circ., Aug., 1906, 283.

CUCURBITACEÆ.

Luffa Aegyptiaca, Mill.—*Proximate Constituents of the Fruit of the Bitter Variety*.—The plant yielding the loofah fruit, the skeleton of which is used for flesh gloves, socks, etc., exists in two varieties, the fruit of one of which is edible in its green state, and of the other is bitter and toxic. In many parts of Bengal the edible variety is used by the poorer classes, either boiled or made into a curry, but the bitter variety is avoided as poisonous; except for its bitterness and a slightly darker color it is scarcely distinguishable from the edible variety. A case of poisoning from the use of the bitter variety by mistake led C. L. Bose, additional chemical examiner to the Government of Bengal, to make a chemical examination of the bitter fruit. By Dragendorff's method he was able to separate two distinct toxic glucosides from the fruit, one of which acted as a severe emetic, and the other as a brisk cathartic, causing much irritation, and giving rise to dysenteric symptoms. The purgative principle resembles colocynthin in its physical properties, its chemical behavior, and its physiological action. The emetic principle is soluble in chloroform, and the purgative principle insoluble. These glucosides were obtained by first treating the powdered fruit with petroleum ether, and then with ethyl ether, which remove oil, but not the glucosides, and subsequently with absolute alcohol, exhausting the alcoholic extract, evaporated to dryness,

with chloroform. The edible species of this and other varieties of allied genera are believed to owe their freedom from poisonous principles to cultivation.—Pharm. Journ., Dec. 22, 1906, 699; from Calcutta Med. Journ., Sept., 1906, 65-74.

COMBRETACEÆ.

Combretum Sundaicum, Miq.—*An Anti-Opium Plant*.—Specimens of a plant having the reputation as a remedy for the opium habit, forwarded by Mr. Leonard Wray, Curator of the Taiping Museum, Perak, have been identified by E. M. Holmes as being *Combretum sundaicum*, Miq. A description of this plant as given by Miquel in the "Flor. Ind. Batav. Suppl." (Sumatra), p. 327, is given, together with an illustration, and some additional details by Mr. Wray, who states that the plant is a woody climber, abundant on the plains near Kula Lumpur, in Selangor. The flowers are white and the fruit red. The leaves have not a characteristic taste, only a faint bitterness and a slight acidity. On being infused in water they give out a yellow coloring-matter. Mr. Holmes adds that a brief preliminary examination made in the laboratory of the society indicates the presence of some substance of the tannin group, but the decoction gives no indication of an alkaloid except with one of the alkaloidal reagents, and until further material is to hand and more detailed examination possible it would be premature to decide whether the reputed property of the plant is real or imaginary, notwithstanding that the Chinese authorities in various towns are distributing the drug free in the confident belief of its remedial value.—Pharm. Journ., Jan. 26, 1907, 77.

Combretum Sundaicum—*History of its Discovery and Use as an Anti-Opium Remedy*.—In connection with the preceeding abstract the following account by L. Wray of the discovery of the "anti-opium plant" (*Combretum sundaicum*), and the reason for its being roasted previous to its use, is quite interesting: "A party of Chinese woodcutters working in the jungle near Seremban, ran out of tea, and to supply its place took the leaves of a jungle climber, dried them, and made an infusion in the ordinary way. This however, was not successful, as it made the men ill with bowel complaint. The leaves were then roasted, and a fair substitute for tea was obtained, which had no ill effects. Then for some obscure reason tengko—i. e., opium dross, or the refuse opium, after being smoked—was mixed with it, and the men continued drinking the mixture for a week or more in place of tea. After this time it was found that all desire for opium-smoking had been lost. Friends of the men were told of the discovery, so the news was spread, and others were induced to try the remedy. Mr. Wray also describes the method of preparing the drug for use, which may be briefly stated as consisting in roasting the leaves and the pieces of twigs of the plant separately, so as not to overheat the leaves, and preparing from this roasted material a decoction in the pro-

portion of 8 to 10 $\frac{2}{3}$ oz. to 4 gallons of water. It appears further that this decoction is not used by itself, but that it is administered with an amount of the so-called "*chandu*," a preparation of opium prepared for the use of opium smokers, in quantity equal to the amount habitually consumed by the smoker. The exact method of use is described in the present paper, which is reprinted from the Journal of the Federated Malay States Museum (December, 1906).—Pharm. Journ., April 13, 1907, 453.

Another paper that is interesting in this connection is communicated by David Hooper, in which, speaking of the

Anti-Opium Leaf described by Mr. Holmes, he calls attention to another plant used as a remedy for the opium habit, which was mentioned by H. N. Ridley in the Journal of the Straits Branch of the Asiatic Society, in July, 1897. This is

Mitragyna Speciosa, Korth., the leaves of which are used, according to Perak, for the purpose mentioned. Mr. Hooper has been unable to obtain any leaves of this species for examination, but secured some leaves of an allied species, *Mitragyna parvifolia*, Korth., a large deciduous tree found in the dry forests of the tropical Himalayas, and throughout the dryer parts of India, Burma and Ceylon. These leaves are light green, rather coriaceous, about 2 $\frac{1}{2}$ by 5 $\frac{1}{2}$ inches, and possess a slight bitter taste and an odor of tea. The powdered leaves yielded 9.75 per cent. of white ash. Extracted by ether they afforded caoutchouc, resins and wax, and the subsequent extraction with alcohol separated a resin acid, tannin, and an alkaloid. The tannin gave a green coloration with ferric chloride. The alkaloid was prepared by digesting the alcoholic extract with water, filtering, adding ammonia, and shaking out with chloroform. The chloroform residue was dissolved in dilute hydrochloric acid, precipitated by ammonia, and again shaken out with chloroform, when the alkaloid appeared as a white crystalline residue of extremely bitter taste. It was soluble in acids, gave precipitates with the usual reagents, and with sulphuric acid and potassium dichromate, a carmine color rapidly fading. The amount of crystalline alkaloid in the leaves was 0.15 per cent.—Pharm. Journ., April 13, 1907, 453.

MYRTACEÆ.

Eucalypts—Important Results of Recent Phytochemical Work.—Henry G. Smith introduces an interesting paper on some recent chemical discoveries in the *Eucalypts* by saying that "perhaps no genus of plants is so rich in distinct chemical constituents as is that important section of Australian trees, the *Eucalypts*, and in no group is the determination of these constituents more helpful in the botanical arrangement and classification of the several species." The knowledge obtained by chemical investigation aids considerably in determination of doubtful species, and often fixes as distinctive characters which might be considered as of little consequence

morphologically. The knowledge thus gained is also of considerable economic value, as each well-defined species appears to give always the same chemical constituents whatever the conditions of growth. In association with his colleague (Mr. R. T. Baker, the Curator) the author has done much phytochemical work on the *Eucalypts*, and they were able by the results to point out the correlation between the venation of the leaves of the several species and the chemical constituents of the plant. This applies to the oil obtainable from the leaves and to the kinos or astringent exudations. The differences observed are not accidental, but the outcome of a well-defined process of evolution, and so constant have the characters been found to be that it was possible to suggest, from the study of the botanical characters of a tree growing nearly 3,000 miles away, what the chemical constituents of the plant would be, and subsequent investigation completely supported that original suggestion.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1906, 295–299.

Leptospermum Liversidgei—*A New Australian Species*.—R. T. Baker and H. G. Smith call attention to a new Australian plant, at first thought to be a variety of *Leptospermum flavescens*, but since found to be a distinct species, both on morphological grounds and by reason of its characteristic chemical constituents. The leaves are not nerveless, as in the type, are imbricate and not spreading, and the size of the flower is different. The new species is remarkable for its lemon odor, and a chemical examination showed that it contained citral, an alcohol considered to be geraniol, an acetic ester (considered to be geranyl acetate), a dextro-rotatory pinene, and a sesquiterpene, which is probably the constituent that gives the lævotation to the higher-boiling portion. The amount of crude oil obtained was only 0.227 per cent., and the percentage of its constituents is given as follows: Citral, 35.00; geranyl acetate, 5.35; free geraniol, 9.74; dextro-pinene, 25.00; sesquiterpene and undetermined, 24.91.—Pharm. Journ., Sept. 1, 1906, 263; from Journ. Royal Soc., N. S. Wales, 39, 124.

ROSACEÆ.

Persian Gum—*Variable Botanical Source*.—It has hitherto been supposed, at the suggestion of Professor Sickenberger, that the so-called "Persian Gum" is derived from *Prunus Bokhariensis*, Royle, and *Prunus Puddum*, Roxb. But Mr. J. M. Hillier, curator of the Kew Museum, points out that the Kew Herbarium contains no specimen of the first-named species, and so far as he can ascertain no description of it has been published. As regards *P. Puddum*, specimens of the gum of this tree and of *Prunus communis*, collected on the Punjaub and sent to Kew, bear little resemblance to the Persian gum of commerce. Dr. O. Stapf states that in 1885 he saw a kind of cerasin gum sold in the Shiraz bazaars, where it was called "Ketirah i arjen," and stated to be derived from the arjen shrub, *Amygdalus leiocarpa*, Boiss. He himself found it plentiful on the ground

underneath and on the stems of a few shrubs of this species on the Kuk Cha Ssia, north of Shiraz. The same gum is sold in Kirman under the name "Djäbd-i-Ardjan," but in Ispahan is replaced by the gum of a plum, "Samgh-i-âlutschah," and of a cherry, "Samgh-i-gilas." The source of the Persian gum is, therefore, variable, but M. Hillier is of opinion that *Amygdalus leiocarpa* yields the greater part of it.—Pharm. Journ., Aug. 4, 1906, 147; from Bull. Kew Gardens, No. 4, 1906, 109.

LEGUMINOSÆ.

Acacia Farnesiana (L.) Willd.—*Occurrence in the Congo Free State.*—According to E. Wildeman *Acacia farnesiana* (L.) Willd., the blossoms of which yield the the oil of "Cassie" of the French perfumers, is found in the Congo Free State, but it is uncertain whether the plant is indigenous in that district. Welwitch is of opinion that this species belongs to the flora indigenous to Angola, and for this reason it is not impossible that it also occurs in the Congo district. As a matter of fact, *Acacia farnesiana* is widely distributed; it is not only found in tropical Africa, but also in Egypt, India, Australia, Hawaii, the Philippines, the West Indies, and in North and South America. In some districts the gum produced by this plant is collected, and used instead of gum arabic. Wildeman observes that in favorable positions the plant is cultivated in the South of France on a large scale, the harvesting of the blossoms beginning when the plants are three years old. The extent of this industry is evidenced by the fact that in France and Algeria 150,000 kilos of "cassie" blossoms have been gathered during the last few years. While no attempts have hitherto been made to utilize the blossoms of *Acacia farnesiana* in the real tropics, for the purposes of perfumery, the author expresses the opinion that the cultivation of this shrub could be tried there under certain conditions with possible advantage. A "cassie" pomade has for many years been made in Northern India, and a "cassie" blossom oil obtained by Schimmel & Co. from Indian pomade was described in their Report of April, 1904.—Schimmel's Rep., April, 1907, 24: from Publication de l'Etat Indépendant du Congo, 1906.

Sterilized Gum Arabic—Preparation and Advantages.—C. Bühner directs attention to the practicability and advantage of sterilizing gum arabic as well as the mucilage prepared from it. It is only necessary to heat the gum itself, or the mucilage, for about half an hour, at 100° C., to obtain a product in which the oxydases are completely destroyed, and thus to render it compatible with easily oxidizable substances, which cannot be dispensed with the gum or mucilage under ordinary conditions. It is noteworthy that the mucilage becomes less viscid and acquires opalescence by the heating; but on the other hand it is filtered more readily than the untreated mucilage, without, however, losing its opalescence.—Schweiz. Wschr. Chem. u. Pharm., xliv, No. 33 (1906), 543.

Brazil Wood—*Reaction with Cocaine and Compounds of Alkalies and Organic Bases.*—See *Cocaine* under "Organic Bases."

Calabar Beans—*Stigmasterin a New Constituent.*—A. Windaus and A. Hauth have demonstrated that the phytosterin obtained by Hesse from the calabar bean is not a simple substance. By acetylation and subsequent treatment with bromine in ethereal solution two distinct brom-derivatives were obtained; one of these contains two atoms of bromine and is readily soluble in glacial acetic acid, alcohol, acetone or ether, while the other contains four atoms of bromine and is relatively insoluble in these solvents: it melts with decomposition at 211° to 212° C. The former on treatment with zinc dust or sodium amalgam yielded an alcohol melting at 136° to 137° C., which proved to be identical with the sitosterin obtained from wheat by Burian and by Ritter; it forms about 80 per cent. of the original phytosterin. The tetrabrom derivative on the other hand treated in the same way gave an alcohol melting at 170° C., which has the formula, $C_{30}H_{48}O$; it forms about 20 per cent. of the original phytosterin, and the authors propose the name stigmasterin for it; it crystallizes with one molecule of water. As it is easily isolated its presence or absence in any particular vegetable oil may serve as a useful distinguishing feature.—Pharm. Journ., March 16, 1907, 331; from *Berichte*, 39 (1906), 4378.

Cape Tea—*Yield and Characters of Volatile Oil.*—Attention is directed in the Autumn Report (1906) of Heinrich Haensel to a volatile oil obtained by steam distillation to the amount of 0.101 per cent. from the leaves of *Cyclopia vogelii* (or *C. genistoides*), which are used in the Cape Colony as a tea for promoting the appetite. The oil has a yellow-brown color and an intensive odor, and deposits paraffin crystals at the room temperature very shortly after its preparation.—Pharm. Ztg., li, No. 80 (1906), 889.

Copaiba—*Detection of Colophonium.*—E. Wahlbaum recommends a method for the detection of turpentine resin in copaiba which is based upon the fact that this resin, even when present in small quantities, produces a characteristic brown color with dilute ammonia, while pure copaiba does not. The test is carried out as follows: 4 Cc. of a 1-per cent. solution of ammonia are placed into a test-tube with 1 Cc. of acetone (for the purpose of clarifying the aqueous solution), and a solution of 2 Gm. of the suspected copaiba in 6 Cc. of ether is poured upon the surface. In the presence of colophonium a brown color is quickly developed. The method becomes quantitatively available by comparing the color with a scale of brown solutions prepared with vesuvin (Bismarck-brown) and enclosed in sealed tubes, the color of such solutions remaining unchanged for a long time.—Pharm. Ztg., li, No. 97 (1906), 1073; from *Arch. Pharm. Kemi*, xiii (1906), 301.

Copaiba—*Detection of Colophonium.*—Dr. G. Mossler recommends the

following method for the detection of turpentine resin in copaiba, which is dependent on the observation that pure copaiba is capable of taking up as much as 35 per cent. of this resin, before it will gelatinize with ammonia: 7 p. of copaiba and 3 p. of colophonium are melted together at a gentle heat. If then 1 Gm. of this mixture is shaken with 10 Cc. of ammonia, and allowed to stand at a temperature of 15° C., no gelatinization should result within 24 hours; but if colophonium was originally present, this is evidenced by the gelatinization of the mixture.—Pharm. Ztg., lii, No. 6 (1907), 56; from Ztschr. d. Allgem. Oesterr. Ap.-Ver., No. 1, 1907.

Gurjun Oil—Similarity of the Product from Different Species.—According to E. Lefevre the oleo-resins of *Dipterocarpus laevis*, Ham., and *D. intricatus*, Dyer, differ very little, the former having a sp. gr. of 0.968, and an acid figure of 6.1, while the latter has a sp. gr. of 0.967, and an acid figure of 6.4. The former yields 79.1 per cent. of volatile oil, the latter 72 per cent. The practice of the Annamites to bulk the products of different trees together seems therefore justified. Several species occur in Annam, but all do not yield an equal abundance of oleo resin, *D. alatus*, A. D. C. and *D. intricatus*, Dyer, yielding the larger quantity, the latter yielding an oil of darker color, while the product of *D. Jourdainii* is of a pale hue.—Pharm. Journ., Jan. 12, 1907, 27; from Ann. Inst., Colon, Marseilles.

Balsam of Hardwickia Pinnata—Determination of Constants.—David Hooper interestingly reviews the literature concerning the oleo-resin of *Hardwickia pinnata*, Roxb., the so-called "wood oil" of South India, which is attracting considerable interest on account of supplies being imported into Hamburg in increasing quantities. Two samples of the genuine oleo-resin have been received in the Indian Museum, Calcutta, and their constants are so uniform that it may be of interest to record them for the benefit of the trade. One sample was obtained from the Papanasam Hills, Tinnevely, and the other was sent by the Forest Officer of South Kanara. They were both thick dichromic fluids with peculiar odor; the first of butyric acid, and the second piperaceous. The following figures were obtained on examination of the samples:

	Tinnevely.	South Kanara.
Specific gravity	1.0124	1.0068
Per cent. of volatile oil	41.1	39.48
Acid value	97.2	99.8
Ester value	9.0	12.6
Saponification value	106.2	112.4
Iodine value	130.3	119.8
Acid value of resin	159.0	157.7

The oleo-resins were freely soluble in 90 per cent. alcohol, ether, chloroform, petroleum ether, and glacial acetic acid; they dissolved in

solution of ammonia with a slight cloudiness, and ultimately gelatinized. A few drops mixed with a few drops of strong sulphuric acid resulted in the formation of a brown solid. Two drops dissolved in 1 Cc. of glacial acetic acid gave a *brick-red* deposit with one drop of sulphuric acid. The oleo-resin of *Hardwickia* is thus sufficiently distinct in its characters to prevent any confusion being made between it and copaiba and gurgjun balsams. The high acid value also distinguishes it from these exudations. Its botanical origin is confined to limited areas in Southern India, and it remains for the Forest Department to exploit the balsam without unnecessarily ruining the trees, or if this cannot be avoided, to take steps to maintain the trees in the forest by natural reproduction.—Pharm. Journ., Jan. 5, 1907, 4.

Hardwickia Balsam—A New Oleo-Resin Resembling Copaiba.—Dr. G. Weigel calls attention to and describes *hardwickia* balsam, an oleo-resinous East Indian product derived from *Hardwickia pinnata* Roxb., which has recently reached the European market in considerable quantities. Owing to its close resemblance, both in appearance and composition to copaiba, its use as a substitute for the latter for various technical purposes, such as porcelain painting, manufacture of varnishes, etc., will probably encourage its importation in increased quantities, while in a pharmacological direction it appears also to deserve some attention. The new "balsam" varies in color from red-brown or brown-red to raspberry-red, and in consistency from more or less thin to thick fluidity, according to the volatile oil content, which has been found as low as 25 per cent., but in the sample examined by the author was present, on an average, to the amount of 48.5 per cent. The balsam itself has a peculiar unpleasant odor, but the colorless oil obtained by steam distillation is remarkable for having, in contradistinction, an agreeable balsamic odor. The specific gravity of the oil is 0.9045, its optical rotation in a 100 Mm. tube, $-8^{\circ}24'$. These figures correspond well with those given in Schimmel's Report (April, 1905), who has also determined the constants of the balsam itself, as follows: Sp. gr., 1.0021 at 15°C .; acid number, 96.15; ester number, 12.31; insoluble in 12 volumes of 80 per cent. alcohol, soluble in 0.4 volume of 90 per cent. alcohol. The resin remaining after the distillation of the oil from the balsam is green in color, brittle, and consists mainly of an acid resin—*hardwickia acid*—with a small percentage of a non-saponifiable resin—*hardwickia resin*, the latter evidently an oxidation product and therefore probably variable in quantity according to age and exposure.—Pharm. Centralh., xlvii, No. 38 (1906), 773-776.

Balsam of Tolu—Quantitative Estimation of Constituents.—T. Delphin recommends the following method for the examination of balsam of tolu: The solution of the balsam in ether is shaken with normal alkali, the liquids separated, and the ethereal solution evaporated. The residue,

dried and weighed, is the *cinnamein*. The alkaline solution is treated with sodium bicarbonate; this precipitates the *resin-esters*, which are collected on a filter, washed, dried and weighed. The filtrate and washings are then acidulated with hydrochloric acid, the resulting precipitate when dried and weighed representing the *resin acids*. The filtrate and washings from these are shaken with ether, and the ethereal solution is titrated with volumetric alkali, which determines the amount of *cinnamic* and *benzoic acid* present, calculated as cinnamic acid.—Pharm. Ztg., lii (1907), No. 39, 407; from Svensk. Farm. tidskr., 1907, No. 3, 4, 5.

Tephrosia Vogelii.—*Relative Toxicity of the Constituents of the Seeds*.—Hanriot has experimented with the object of ascertaining the relative toxicity of the three substances—*tephrosine*, *tephrosal* and a *yellow body*—which have been isolated from the seeds of *Tephrosia vogelii*. He finds that *tephrosine* is by far the most active, and thinks it possible that the slight poisonous action of the *tephrosal* may be due to traces of tephrosine carried over by the vapor of water, in preparing it. When tephrosal is recently prepared it has an intoxicating, lively (*vive*) odor likely to attract fish. The *yellow body* is also but little active, and the little activity it has may possibly be attributed to traces of tephrosine. When pure, tephrosine is almost insoluble in water, but even one part in 50,000,000 of water is fatal to some fishes, and 1 in 250,000 to others, thus exceeding the poisonous action of aconitine, and equaling that of the toxins in the minuteness of the fatal dose. But it is much less poisonous to other animals, thus the rabbit can eat the leaves with impunity, and dogs can take the enormous dose of 1 grain of tephrosine mixed with their food without any apparent inconvenience, and crustaceans, such as the lobster, crab and crayfish are only excited by it.—Pharm. Journ., June 8, 1907, 749; from Compt. rend., 144, 498–500.

TEREBINTHACEÆ.

Dammar Resin, (?)—*A Dark Variety from Assam*.—The "Oil and Color Journal" (1906, 29, 1793), calls attention to a dark resin occurring at Cashar, in Assam which, although possessing the characters typical of dammar resin, deviates in a certain degree from the dark dammar resin of commerce, which is derived from *Canarium strictum*. The Assam resin occurs in large, flattened pieces, exhibiting small pieces of bark on the surface, is of a dark-brown color and has a glassy conchoidal fracture. It is readily soluble in oil of turpentine, benzin, chloroform, and acetic acid anhydride, but only partly soluble in alcohol or ether. It melts at 125° C., and on combustion leaves 0.78 per cent. of ash. The saponification number was found to be 9.43, the acid number 8.15, and the ester number 1.28. Its solution in acetic acid anhydride gives a deep purple color on addition of a drop of concentrated sulphuric acid, and when the latter is added to a solution of the resin in chloroform, a yellow color is de-

veloped which gradually changes to ruby-red.—Pharm. Ztg., li, No. 63 (1906), 703; from Chem. Ztg.

Mango Gum-resin—Characters and Analysis.—The conflicting statements concerning the characters of the exudation of the mango tree (*Mangifera indica*) induced David Hooper to undertake its description and examination as derived, in numerous examples, from several mango trees growing around Calcutta. These gummy exudations were resinous in character, like bird-lime, soft and sticky, and varying from a pinkish-white mass to amber-colored tears. There was a slight terebinthinate odor and bitterish taste. Small portions dissolved largely in spirit, leaving a white pulverulent gum, but they were only partially soluble in water. They burnt with a resinous flame and, as observed by Colonel Dury, emitted an odor of roasted cashew nuts. Submitted to analysis the clean gum-resin showed the following composition :

Moisture	4.34
Resin	79.16
Gum.	14.68
Ash.	1.66
Loss	0.16
	<hr/>
	100.00

A sample of gum-resin from another tree afforded 78.4 per cent of resin. The resin was soluble in alcohol, ether, chloroform, bisulphide of carbon and glacial acetic acid. Its acid value was 66.55. The gum was adhesive, gelatinized with solution of ferric chloride, and gave a white precipitate with neutral lead acetate, but was not affected by solution of borax.—Pharm. Journ., June 1, 1907, 718.

Rhus—Poisonous Species and Treatment.—Prof. A. B. Stevens interestingly reviews the characters of the poisonous species of *Rhus*, of which there are five growing in the United States. Of these the one most commonly met with is *Rhus radicans* (poison ivy or three-leaved ivy), which is often found climbing trees, whilst *Rhus diversiloba* and *Rhus toxicodendron* are more shrubby; although *R. diversiloba* may under circumstances also become a parasitic vine. Another poisonous species, found on low swampy ground in the Eastern States and Canada, is *Rhus vernix* L. (*R. venenata* D. C.) This is a shrub growing from six to eighteen feet high, and is known under numerous names—poison sumach, poison ivy, poison elder, poison tree, poison ash, poison dogwood, swamp dogwood, and swamp sumach. The Japanese species—*Rhus vernicifera* D. C., is somewhat like the preceding, but grows much larger. The author enumerates a very large number of remedies that have been proposed and are in use for the treatment of rhus poisoning. The remedy most frequently used in his locality (Ann Arbor, Mich.) is solution of lead subacetate, but the

author thinks that an alcoholic solution of lead acetate would be better, as the poison is insoluble in water. In either case the lead compound which is formed with the poison is easily decomposed, and the poison again becomes active. An alkaline treatment is more logical, as an excess of alkalis forms a compound which is insoluble in the ordinary solvents, and cannot be decomposed into an active substance. He recommends thorough washing of the affected parts with a two per cent. alcoholic solution of sodium hydroxide and after ten minutes to wash with warm eight per cent. solution of sodium bicarbonate. This may be repeated three or four times a day if necessary. As the poison is soluble in fats and oils, these should never be used for the treatment of rhus poisoning.—Proc. Mich. State Pharm. Assoc., 1906, 61-64.

Rhus Toxicodendron—*Poisonous Constituents of Leaves*.—Acree and Syme have recently subjected the leaves of *Rhus Toxicodendron* to proximate examination, with results which lead them to the conclusion that the poisonous constituent of this plant is a gum-like or waxy substance having the characters of a complex glucoside and yielding, by hydrolysis with acids, gallic acid, fisetin, and rhamnose, the last three, non-toxic, constituents persisting also in the plant. The

Poisonous Constituent is isolated from the leaves by extracting them with alcohol, filtration of the 'incture, precipitation with lead acetate, washing the precipitate, drying, and extraction of the dried precipitate in a Soxhlet apparatus with ether. The ether solution, which now contains only the lead compound of the poisonous glucoside, is diluted with water, treated with H_2S , separated from the aqueous layer, filtered, washed with water, and evaporated at a low temperature.—Pharm. Ztg., li, No. 90 (1906), 998; from Amer. Chem. Journ., 1906.

RHAMNACEÆ.

Cascara Sagrada—*Tasteless Preparation*.—An active preparation of cascara sagrada is obtained according to H. Knopf as follows: 500 Gm. of the powdered drug are macerated three or four times successfully for 2 or 3 hours with 15 liters of water and pressed. The filtered liquid is evaporated in a vacuum to complete dryness. The extract is powdered and exhausted with absolute alcohol. To the clear dark-brown alcoholic liquid alcoholic solution of potash is added as long as a precipitate is formed; this is then collected, washed and dried. It is said to be odorless, free from bitterness, but an active purgative.—Pharm. Journ., Dec. 29, 1906, 723; from Chem. Ztg., 30, 565.

Rhamnus Cathartica Seeds—*Characters of Fixed Oil*.—N. Krassowski has extracted from the seeds of the fruits of *Rhamnus cathartica* by means of ether 8.5 per cent. of fixed oil, which after purification by treatment with petroleum ether and soda solution exhibited the following

characters and constants: Odorless; sparingly soluble in alcohol; freely soluble in ether, chloroform and benzol; sp. gr., 0.9195 at 15° C.; saponification number, 186; Hehner number, 95.77; iodine number, 155; Reichert-Meissl number 0.89; acid number, 5.64. The non-volatile acids prepared from the oil have the iodine number 160.8, the acetyl number 25.8, and the average molecular weight 288.9. The percentage composition of the oil is probably as follows: Non-saponifiable substances (phytosterin and hydrocarbon), 0.59 per cent.; volatile acids (butyric), 0.24 per cent.; stearic acid, 6.00 per cent.; palmitic acid, 1.12 per cent.; isolinolenic and linolenic acids, 22.40 per cent.; linoleic acid, 35.20 per cent.; oleic acid, 30.10 per cent.; glyceryl radical (C_3H_5), 4.32 per cent.—Apoth. Ztg., xxi, No. 61 (1906), 643; from Journ. d. russ. physik. Ges., 1906, 144.

Frangula Bark—Influence of Time of Collection and Storage on the Anthraquinone Content.—Dr. Tunmann, as the result of investigation extending over a period of several years, finds that the age of frangula bark cannot be determined with certainty by the increase in the quantity of anthraquinone derivatives, because of the variations due to the period of collecting the bark. Thus, two-year old bark, collected at different periods (from July of one year to April of the next) yielded the following actual percentages of anthraglucosides: July, 0.87; August, 0.80; October, 1.08; November, 1.17; December, 1.36; February, 1.68; April, 1.72 per cent. These results show, however, that the usual time for collecting the bark—April to June—is the most favorable for the subsequent formation of anthraglucosides.—Pharm. Centralh., xlviii (1907), No. 6, 99–103.

EUPHORBIACEÆ.

Rubber Plants—Raid on the Botanic Gardens of the Malay Peninsula.—H. N. Ridley, the Curator of the Botanic Gardens of Singapore, states that the demand for plants and seeds of the rubber plants, especially for Dutch territory, is so large that it has become worth while for Malays to raid plantations by night and ship the plants to Dutch Borneo. Upwards of a thousand seedlings were stolen from the nurseries at the Botanic Gardens in one night, and a planter in Malacca lost 10,000 in three raids. Investigations in Singapore showed that a very large export of seedlings has been going on from Singapore, chiefly to Banjernassin, at the rate of 1.3 to 30,000 a week. At one time it was proposed to prevent the export of rubber seedlings from the Malay Peninsula, and it is regrettable that this proposal was not carried into effect.—Pharm. Journ., Sept., 1906, 263; from Gard. Chron., 40, 131.

Funtumia Elastica—Examination of the Latex.—According to H. Strunk, *Funtumia elastica* is the most important india-rubber plant of West Africa. The latex is obtained by incising the bark, and is usually coagu-

lated by mixing it with one-half or one-third its volume of water and heating to boiling; the rubber separates as a white, curdy mass, from which the watery liquid can be separated by pressure. The composition of the latex was found to vary according to the position of the incisions on the plant—the higher the incisions, the smaller the quantity of rubber in the latex and the larger the proportion of substance other than rubber. The latex of the leaves contained nearly as much rubber as that from the base of the stem. For coagulation heat is not necessary; it can be effected by simply pouring the latex into five times its volume of water. The addition of 1 per cent. of HCl produces rapid coagulation and yields an excellent rubber.—Pharm. Journ., Oct. 6, 1906, 381; from Ber. d. D. Pharm. Ges., 16, 214.

Chinese Tung or Wood Oil—Botanical Source.—E. M. Holmes mentions that while until recently the "Chinese Tung or Wood Oil" has been unhesitatingly referred to *Aleurites cordata*, R. Br., Mr. W. B. Hemsley has now been led, by the examination of a series of Chinese species of the genus, to the conclusion that the source of the true Chinese tung oil is a new species hitherto undescribed, viz., *Aleurites fordii*, Hemsl, although *A. cordata* affords a similar oil (Kew Bull., 1906, ix, p. 398). It seems probable also that some tung oil is obtained from the seeds of *Aleurites trisperma*, Blanco, a native of the Philippines. The new species, *A. fordii*, is distinguished by having foliar glands that are smaller than those of *A. cordata*, and not cup-shaped, by the broader petals, glabrous within at the base, the bifid styles, and the fruit not varicose on the surface.—Pharm. Journ., Feb. 9, 1907, 128.

Cascarilla—Additional False Barks and Reappearances of True Bark on the Market.—In continuation of his investigations of the cascarilla barks of commerce, C. Hartwich now reports on the recent observation of five false barks in addition to the three previously described (see Proceedings, 1905, 682). These false barks are derived from different species of *Croton* and are all distinguished from the genuine cascarilla bark by the presence of sclerotic cells in the primary bark. They are distinguished, however, from the three false barks previously examined by the absence of stone-cells in the primary bark, by the thickness of the primary fiber, and by the occurrence in the entire bark of brown cells containing phlobaphenes. A further interesting observation to which the author calls attention is the occurrence on the Hamburg market of a bark, designated as "natural bark" which could not be distinguished by its structural elements from true cascarilla bark. Nevertheless, even this evidently genuine bark is not free from objection since it always contains barks of other species of *Croton* in admixture.—Apoth. Ztg., xxi, No. 73 (1906), 776.

Kamala—The Ash Content.—R. L. Schulz contributes an interesting compilation concerning the ash content of kamala, which, as is well-

known, is sometimes as high as 65 per cent. or even more. Tabulated statements concerning the kamala of commerce from the year 1888-1905, compiled from the reports of two prominent German importing firms, show that while it is possible to obtain kamala yielding as little as $2\frac{1}{2}$, 3, and 5 per cent. of ash, the supply of drug of that quality is very limited, and the bulk of the importation on the London and other European markets continues from year to year to have the same high percentages of inorganic impurities. Concerning the method of purification resorted to, these are of two kinds—wet and dry. The latter consists of a process of sifting and also purification by means of a current of air; the wet method, official in the Hungarian Pharmacopœia for the preparation of a "kamala depuratum," consists of stirring commercial kamala, without rubbing, into a thick homogeneous mass with water, elutriating the magma with water, collecting the light powder on a filter, and drying this at a gentle heat—the heavy residue, amounting to about $\frac{1}{4}$ or more of the original, being thrown away. This method has been found wanting and has been criticized as probably harmful, notably by advocates of a dry method of their own, who, however, fail to describe their improved method. In a recent examination of commercial kamalas, the mean percentage of ash found was 35.17 per cent., using a platinum crucible and as high a temperature as a common Bunsen burner would supply. This amount was not materially diminished by prolonged heating of the entire ash until all the carbon had been burned off. A copious bibliography is appended to the original paper, in *Pharm. Rev.*, May, 1907, 129-138.

Indian Kamala—Adulteration and Remedy.—David Hooper observes that kamala (*Mallotus Philippinensis*) is subject to adulteration, and its reputation has declined within recent years, partly on this account and partly because of the influx of modern aniline dyes into India. Out of twenty samples exhibited in the Indian Museum only seven samples afforded less than 10 per cent. of ash. It is evident that Kamala collected under personal supervision or derived from the Forest Department is superior to supplies purchased in the bazaars. Bazaar samples purchased from towns in the United Provinces yielded as much as 61.6 and 87.3 per cent. of mineral matter.—*Pharm. Journ.*, Sept. 1, 1906, 258.

Ricinus Seeds—Question of Toxicity.—Experiments made by K. Birnbaum point out that the poisonous character of ricinus seeds has been largely over-estimated, at least in so far as concerns their effect upon animals. The seeds were fed to horses in gradually increased doses up to 100 Gm. without producing any symptoms of discomfort or ill-effects. He concludes that the consumption of quantities so large as to produce death is of rare occurrence, and that such excessive quantities in the food must be established before the lethal effects can be attributed to these seeds.—*Pharm. Ztg.*, li, No. 90 (1906), 988; from *Berl. Tierärztl. Wschr.*, 1906, No. 41.

Referring to Birnbaum's conclusions respecting the toxicity of ricinus seeds, Professor Kobert calls attention to the fact that the observations upon which Birnbaum's conclusions are based were made with gradually increased doses of the seeds, whereby, most likely, the animal was rendered immune to the action of the poison. This, indeed, agrees with his own conclusions, as mentioned in his "*Lehrbuch der Intoxikationen*" (2d ed., vol. II, p. 701), to the effect "that the relative immunity of individuals to the poisonous effects of ricinus seeds must be ascribed to the circumstances that such persons have previously several times partaken of smaller doses of ricinus seeds before taking the lethal dose which resulted simply in severe illness without proving fatal." He maintains that if the larger dose mentioned by Birnbaum had been administered initially, the result would probably have proven fatal to the animal.—*Pharm. Ztg.*, li, No. 96 (1906), 1062.

Castor Oil—Efficient Formula for Disguising the Taste.—J. B. Moore recommends the following formula, which he has found efficient for disguising the repulsive taste of castor oil: If the preparation is to be taken at the counter, mix in a tumbler 2 drachms of compound tincture of cardamom and 6 drachms of cinnamon water; then pour the requisite dose (1 ounce or q. s.) upon the center of this aromatic mixture and squirt upon the castor oil four or five jets of good brandy, as a bartender would with bitters in making a cocktail. Now give the tumbler a gentle, circular movement, not sufficient to much disturb the mixture, hand it out with direction to swallow it right down, swallow after swallow, to avoid tasting the oil. If the preparation is to be taken at home, a label might be affixed to the container, giving explicit directions how to avoid admixture during transit and how to take the preparation.—*Proc. Penn. Pharm. Assoc.*, 1906, 237.

Shellac—Adulteration with Pine Resin.—Dr. G. Weigel has subjected various commercial sorts of shellac to examination with the object to determine the extent, if any, that these are adulterated with pine resin (colophonium). For this purpose the lac was powdered, mixed with washed river sand, and extracted for several hours in a Soxhlet apparatus with petroleum ether. In this way dark-blocked Tonquin shellac and dark Tonkin blood-lac each yielded 1.6 per cent., and orange-colored leaf-shellac 1.8 per cent. of its weight to the petroleum-ether, whereas a specimen of light Indian, so-called blood- or button-lac, yielded 14.6 per cent. of a substance which had the characteristic odor of pine resin after the solvent had been evaporated, and was particularly evident on slightly heating it. Genuine shellac is said to yield at most 3 per cent. of its weight to petroleum-ether.—*Pharm. Centralh.*, xlvii, No. 43 (1906), 892.

Shellac—Products of Dry Distillation.—A. Etard and E. Wallée subjected shellac, mixed with an equal weight of sand, to dry distillation, and

obtained 6 per cent. of gaseous products, 72 per cent. of liquid distillate, and 22 per cent. of a coke-like residue. The liquid distillate consisted of a watery layer upon which a brown, viscid, faintly fluorescent oil (sp. gr. 0.975), amounting to about 52 per cent. of the shellac, floated. This oil was soluble to the amount of 40 per cent. in dilute alkalis, the solution yielding an oil with a strong odor of fatty acid, which on analysis proved to consist of oleic, caproic and sebacic acid. The portion insoluble in alkalis contained terpenes, a diterpene, a polyterpene and a saturated hydrocarbon ($C_{32}H_{66}$), which were separated from each other by fractionation. On the strength of his examination, the author regards shellac to be a not very stable oleate of a continuous series of polyterpenes.—Schimmel's Rep., October/November, 1906, 72; from Compt. rend., 140, 1603.

URTICACEÆ.

Hops—Simple Method of Valuation.—G. Coez finds that the amount of benzol extract affords a valuable criterion of the quality of brewer's hops. Ten Gm. of the powdered hops is extracted in a Soxhlet for thirty minutes with pure benzol. After distilling off the solvent, the residue is dried and weighed. This was found in eighteen different samples to range from 19.05 to 12.85 per cent. The best specimen was from California. Worcester's came fourth in order with 17.1 per cent., closely followed by Sussex with 16; the highest Kent sample was 14.6 per cent. The lowest position was from Busigny, with a benzol extract of 12.85. The residue from sulphured hops is brown, that from unsulphured, green.—Pharm. Journ., Mar. 9, 1907, 293; from Annal. de Chim. Analyt., 11, (1906) 466.

Glandulæ Lupuli, Pharm. Nederl.—Correction of Requirement of Ash-Content.—Cæsar & Loretz in their Fall Report (1906) call attention to the impossibility of conforming with the requirement of the Pharm. Nederl. that lupulin shall not yield more than 6 per cent. of ash, unless, as is doubtless not contemplated, the drug be subjected to a process of elutriation, which would injure the drug both in color and odor. They find that natural, sifted lupulin, of good quality, will yield from 14 to 20 per cent. of ash, and that even with the most careful mechanical process of separation from the hops a lower ash-content than 10 per cent. is not attainable.—Pharm. Ztg., li, No. 75 (1906), 830.

BETULACEÆ.

Carpinus Betulus L.—Ellagen-tannic Acid a Probable Constituent.—K. Alpers has subjected the leaves of the common hornbeam (*Carpinus betulus* L.) to comprehensive proximate examination, and finds it contains as principal constituent a peculiar non-glucosidal tannic acid, which he finds to possess close resemblance to ellagen-tannic acid. It contains neither glucosides nor alkaloids. The non-glucosidal characters of the tannin distinguishes it substantially from that of the *myrobalanes*, of

algarobilla, and of *dividivi*. The tannin splits off ellagic acid very readily, the acid being readily deposited from the tinctures made with 40 per cent. alcohol. The author records voluminous experiments to determine the nature of ellagic acid, the constitution of which has so far not been accurately determined. He regards the air-dry acid as being hexaoxydiphenyldicarbonic acid.—Arch. d. Pharm., 244 (1906), 577-601.

CONIFERÆ.

Pinus Resinosa and Pseudotsuga Taxifolia—Possible Utilization of the Oleoresin Content heretofore Wasted.—In a review of a recent experimental inquiry by G. B. Frankforter concerning the nature and possible utilization of the oleoresins from the Norway pine (*Pinus resinosa*) and Douglas fir (*Pseudotsuga taxifolia*), Schimmel & Co. mentions that the steadily increasing consumption of oil of turpentine lends particular interest to the inquiry. These two coniferae, which are largely distributed chiefly in the North and West of North America, are up to the present only used as lumber. Wood containing too much turpentine is either burnt, or simply thrown aside. The utilization of such waste products for the manufacture of turpentine has not yet been found sufficiently remunerative in these districts, and for this reason almost all the turpentine oil used in the North and West must be obtained elsewhere. The box-system universally employed in the South for the production of turpentine is not applicable in the North and West. It is therefore necessary to work out first of all a method for the industrial utilization of the waste products suitable for the prevailing conditions. Frankforter has in his studies come to the following results.

1. *Pinus resinosa*. The water-white turpentine had been obtained partly by the box-system, and partly from stumps of trees and other waste material, by means of extraction, distillation by steam and dry distillation. The examinations showed that the working-up of these waste products is remunerative, not only for the production of oil of turpentine, but also of tar and other by-products. Lean wood yielded on the average 6.2 per cent., average quality 8.6 per cent. turpentine. Stumps yielded 19.4, pitchy wood 39.1, and very pitchy wood even 42.6 per cent. turpentine. Its constants were: $d_{40} 0.8137$ (erratum?); $[\alpha]_{D_{20}} + 4^{\circ}$; $n_D 1.47869$; it contained 22.1 per cent. oil of turpentine, 77.3 per cent. of colophony, and 0.6 per cent. water, and on being left standing it became in one or two months' time either semi-solid or solid, according to the content of oil.

2. Douglas Fir. The turpentine-content was, in very lean wood 11.6 per cent., in lean wood 13.5, medium quality 19.8, rich wood 40.7 and very rich wood 42.4 per cent. On the whole the balsam was water-white and very mobile; but it became darker on exposure to the air, and gradually became viscid. In the fresh state it had a peculiar aromatic odor. $d_{20} 0.9821$; $[\alpha]_D - 8.82^{\circ}$; $n_{D_{20}} 1.51745$; the yield of oil was 22 per cent.

The oils from the two species of wood show fairly large differences according to the manner of production, whether by extraction and steam distillation, or by dry distillation. The last-named method yields apparently more complicated products which distill within wide boiling limits.—Schimmel's Rep., April, 1907, 98; from Journ. Amer. Chem. Soc., 22 (1906), 1467.

Finus Silvestris, L. and Pinus Abies, L.—Constituents of the Oleoresins.—O. Aschan obtained from the semi-liquid turpentine of *P. silvestris*, L., 9.2 per cent. of terpenes and from the somewhat harder product of *P. abies*, L., only 4.5 per cent. The fractionation of these oils points out that in the lower boiling fractions other terpenes, besides pinene, must be present, and further experiments proved the presence of l-pinene in the turpentine of *P. abies*, whilst d-pinene, a constituent already determined in Finnish and Swedish turpentine oils, was found in the turpentine of *P. silvestris* and is consequently probably also a constituent of Russian turpentine oils which are obtained from the last named. Furthermore, the author has determined with certainty the presence of sylvestrene in the turpentine of *P. silvestris*, and he concludes from the greatly increasing lævogyration of the higher boiling fractions of the oil from *P. abies* that the presence of a comparatively large amount of l-limonene may be accepted as a constituent of the latter oil. Commenting on this paper, Schimmel & Co. regard the detection of sylvestrene as of particular interest since they had previously discovered this hydrocarbon in German oil from the needles of *P. silvestris*.—Schimmel's Rep., October/November, 1906, 76; from Berl. Berichte, 39 (1906), 1447 and 2596.

Cade Oil—Test of Distinction from Pine Tar Oils.—C. Pépin has traced some oils of cade to their source, St. Sauveur, Var and Gard in the South of France, districts in which this oil is actually distilled from *Juniperus oxycedrus* L. The distillation is there carried on from September to May, and the product of distillation is best left standing for 2 to 3 weeks, the upper one of three layers composing the oil, which is lighter than water, should have a brown-red color, and a distinct smoky odor. A simple method for distinguishing cade oil from pine tar oils, etc., is the following: 1 Cc. of the oil is strongly shaken with 15 Cc. of petroleum ether and filtered; 10 Cc. of the filtrate are mixed with an equal volume of a neutral 5 per cent. solution of copper acetate, again shaken, and the mixture left standing for some time; 5 Cc. of the petroleum-ether layer are then removed and mixed with 10 Cc. of ethyl ether. In the case of genuine oil of cade, only a faint yellow-brown coloration occurs, whereas the mixture acquires an intense green color if the oil is adulterated with pine tar.—Schimmel's Rep., October/November, 1906, 13; from Journ. de Pharm. et Chim., vi, 24 (1906), 49.

In a second paper, the author gives additional characters of the oil de-

rived from *Juniperus oxycedrus*. It is a mobile liquid, having a smoky odor, an acidity (calculated for acetic acid) of less than 1.5 per cent., and gives a brown coloration with petroleum ether and copper acetate. Between 150° and 300° C. (ordinary pressure) at least 65 per cent. must pass over, and between 100° and 215° C. (65 Mm. pressure) at least 70 to 75 per cent. of the oil.—*Ibid.*, April, 1907, 14; from Journ. de Pharm. et Chim. vi, 24 (1906), 248.

B. ANIMAL DRUGS.

Cantharides—Improved Process of Assay.—After a comprehensive review of the different assay methods for cantharides, P. A. W. Self and Professor Henry Greenish point out the defects of those in current use and record the results of their studies and experiments, undertaken with the object of perfecting a reliable and practical process. They find that the principal sources of error are due to loss of cantharidin by volatilization on distilling off the volatile solvent used for its extraction, and to the difficulty of removing the fat and resin associated with it under the conditions of the assay as ordinarily carried out. Both of these sources of error are eliminated, however; that, using benzene for the extraction of the drug, any cantharidin volatilized with the solvent during distillation is readily recovered by shaking the distillate with a 1-per cent. solution of potassium hydroxide, and on the other hand that the cantharidin can be completely removed from the fat with which it is associated by repeated boiling with water, in which it is sufficiently soluble for the purposes of the assay. Without going into the details of their experiments, the improved process recommended by the authors may here find place in full, as follows:

Take 20 Gm. of cantharides in fine powder and moisten it in a mortar with 3 Cc. of strong hydrochloric acid; pack it in a Soxhlet and attach a 280 Cc. wide-mouth flask as receiver. Then pour off 80 Cc. of benzene, attach a reflux condenser, and extract on a sand-bath for two hours, adding a little more benzene during the process, if necessary. Wash the cantharides and the Soxhlet with 25 Cc. of benzene. Distil off the benzene as far as possible on a water-bath, and drive off the last traces by immersing the flask in hot water and blowing in air. Shake the distilled benzene with successive portions of 20 Cc., 20 Cc., and 10 Cc. of a 1 per cent. solution of potassium hydroxide to recover traces of cantharidin which distil over; acidify the mixed alkaline shakings with hydrochloric acid, make up to 105 Cc. with distilled water, and add to the residue of the fat and cantharidin in the flask. Then boil the mixture for ten minutes under a reversed condenser, allow the fat to separate, and, while the liquid is still near the boiling-point, transfer 100 Cc. of the aqueous layer to a separator capable of holding about 500 Cc. This is best done by means of a 50-Cc. pipette. Repeat the boiling and separation with four more quantities of 50 Cc. of water, each time boiling the mixture for five minutes, and frequently well

shaking. To the mixed aqueous liquid add 3 Cc. of strong hydrochloric acid, and shake out with successive portions of 30 Cc., 30 Cc., 20 Cc. and 20 Cc. chloroform. Transfer the chloroformic solutions to a tared flask, distil off the chloroform, and drive off the last traces by gently heating. Then wash the residue with three portions of 5 Cc., 5 Cc. and 2 Cc. of a mixture of equal parts of absolute alcohol and petroleum spirit saturated with cantharidin, pouring the washings through a plug of cotton wool in a small funnel. Wash the flask and cotton wool with petroleum spirit until a little of the filtrate on evaporation leaves no appreciable residue. Then pour a little chloroform through the cotton wool into the flask, in order to dissolve any crystals of cantharidin retained. Evaporate and dry at a temperature of 60° to 65° C., until of constant weight.

The above process is more easily and rapidly carried out in practice than would appear from the description, the assay requiring altogether about four and a-half hours, two hours of which are taken up by the Soxhlet extraction.—Pharm. Journ., March 16, 1907, 324-328.

Cochineal—Determination of Tinctorial Value.—Cæsar & Loretz in their Fall Report (1906) recommend the following simple method for determining the tinctorial power of cochineal: 1 Gm. of powdered dry cochineal is heated in a graduated flask for one hour on a steam-bath with a solution of 5 Gm. KOH and 20 Gm. water, and, after cooling, the mixture is diluted with water to 100 Cc., well shaken, and filtered through a tuft of cotton. This is *Solution A*: A solution of 0.316 Gm. potassium permanganate in 1000 Cc. of distilled water is now prepared, and 12.5 Cc. of this solution are diluted in a glass cylinder to 100 Cc. with distilled water. This is *Solution B*: For comparison, 100 Cc. of distilled water are placed into a glass cylinder of the same size and shape as that used for solution *B*, and colored with solution *A* until the color is identical with that of solution *B*. If the cochineal is of normal quality, 2.5 Cc. of solution *A* should be required.—Pharm. Ztg., li, No. 75 (1906), 830.

Beeswax—Saponification.—George Buchner's experience in the examination of thousands of specimens of beeswax does not agree with the statement of Bohrisch and others that some specimens of genuine beeswax are more readily saponified than others, but that it depends solely on the strength of the alcohol used for the preparation of the alcoholic solution of the alkali used for the saponification. The conditions necessary for rapid and complete saponification of any specimen of genuine beeswax are formulated by the author as follows: 1. The use of absolute or at least 96-per cent. alcohol for addition to the wax as well as for the preparation of the alcoholic solution of KOH. 2. Strong boiling on an asbestos-wire net over the direct flame, preferably by conducting the process with the aid of a Soxhlet apparatus, so that at times a stronger alkaline solution may come into action. 3. Sufficient excess of KOH solution, using at

least 35 Cc. of $\frac{N}{2}$ solution to 3.6 Gm. of wax. 4. The saponification to be continued for one hour from the beginning of ebullition.—Apoth. Ztg., xxii (1907), No. 12, 119; from Chem. Ztg., 1907, 126.

Yellow Wax—Pharmacopœial Characterization and Examination.—Dr. P. Bohrisch makes some critical observations concerning the characterization of yellow beeswax in the G. P. IV, which in his opinion requires considerable amendment. It should be defined as a yellow or *gray-yellow* mass, obtained by carefully fusing honeycombs, freed from any artificial (ceresin) combs with which these may be associated; having a granular fracture, a sp. gr. of 0.960 to 0.970, and melting at 63° to 64° C. with formation of a clear fluid of a honey-like odor. After discussing the action of solvents, and the methods of determining the physical constants, he makes some important suggestion concerning the determination of the acid and saponification number. He finds that in determining the acid number of yellow wax it is important to titrate the hot alcoholic liquid as rapidly as possible, so that the titration may be completed before the cooling has gone so far as to cause turbidity; a second warming is not permissible, as the acid number will always be too high in consequence of the partial hydrolysis of the esters present; it appears to range from 20 to 22. For the saponification two hours at least are required, even when the flask is immersed in the water-bath, and four if the boiling is conducted on a wire gauze; the liquid should be again heated for five minutes after the titration is completed, as it becomes slightly alkaline. The saponification number ranges from 92.0 to 98.0, and the ester number from 73.5 to 76.0.—Pharm., Centralh., xlvii (1906), No. 52, 1065–1068.

Wax—Detection of Paraffin.—Dr. G. Mossler recommends the following simple method of detecting the presence of paraffin or ceresin in wax: 5 Gm. of the wax are saponified with alcoholic alkali-hydroxide, the alcohol is evaporated, 20 Cc. of glycerin are added, and the mixture is heated until solution is effected. If then 100 Cc. of boiling water are added, a transparent or translucent solution is formed if the sample contains more than 5 per cent. of the paraffin.—Pharm. Ztg., li (1907), No. 6, 56; from Ztschr. d. Allgem. Oesterr. Ap.-Ver., 1907, No. 1.

Turtle Oil—Characters and Constants.—A sample of turtle oil, representing a consignment recently offered at the London drug auctions, was examined by C. Edward Sage. The oil was of a yellow color, had about the consistence of soft beef dripping, and a taste and odor resembling the latter substance. Analysis yielded the following factors, which agree very closely with those quoted by Lewkowitsch:

Specific gravity at 25° C.	0.9192
Refractive index at 30° C.	1.4677
Refractive index at 50° C.	1.4665
Acid-number	1.1
Saponification-number.....	211.3
Iodine number	111.0
Melting-point	24°-25° C.
Solidifying-point	19°-18° C.
Reichert-Wollny number.....	4.84

—Chem. and Drugg., Nov. 3, 1906, 691.

Adeps Lanae—Determination of Acidity.—Dr. G. Mossler has observed that when aqueous solution of NaOH and phenolphthalein solution are added to the ethereal solution of wool fat, in the determination of its acidity, a mixture results in which the change of color is recognized with difficulty. He recommends that it is better to dissolve 10 or 12 Gm. of the wool fat in 5 times the quantity of benzol and after the addition of a few drops of phenolphthalein solution, to titrate with alcoholic $\frac{1}{10}$ solution of NaOH, whereby a distinct color reaction is obtained. For 10 Gm. of the fat, not more than 0.5 Cc. of the $\frac{1}{10}$ alkali should be required. The latter may be conveniently made by diluting $\frac{1}{2}$ solution of NaOH to 5 times its volume with alcohol.—Pharm. Ztg., lii, No. 6 (1907), 56; from Ztschr. d. Allgem. Oesterr. Ap.-Ver., No. 1, 1907.

Lanolin—Utility of Different Commercial Grades.—Louis Spencer Levy remarks in "The American Perfumer" that the American manufacturer of toilet preparations has been very slow to take up the use of lanolin. Yet in Europe, especially in England and Germany, this product forms the chief base of many creams, and is used with satisfactory results. There is, however, renewed interest in this subject on account of the desire to make creams which cannot become rancid, and this is one of the most valuable characteristics of lanolin. The lanolin of present-day commerce may be roughly classified in two divisions—the fully refined, suitable for pharmaceutical purposes, and the little refined, from which the fatty acids have not been removed. The first variety is marketed in two forms—one practically odorless and almost pure white in color, the other with a faint, fatty though not disagreeable odor and of a slightly cream tint. So far as its use in soap is concerned the slight odor and color of the second kind offer no special disadvantage, but when used in face cream, etc., these properties are masked by the attractive coloring pigment and pleasing perfumes that are added to enhance the salability of the finished product. Soap makers, however, have learned that it does not pay to use unrefined lanolin. This costs from 5 to 14 cents a pound, while the refined costs very little more in large lots. The fatty acids remaining in the unrefined product impart a bad odor and color to any soap, and expensive perfumes are necessary to counteract the smell.

The United States and British Pharmacopœias specify that hydrous lanolin shall contain at least 30 per cent. of water, so as to make it workable under a spatula, and therefore this percentage of water is incorporated in the hydrous. The anhydrous is probably cheaper in the end, for when added to a face-cream mixture the necessary water may be added at the same time and thoroughly incorporated by careful mixing.—*Midland Drugg.*, Dec., 1906, 300.

INORGANIC CHEMISTRY.

OXYGEN.

Compressed Oxygen—Precaution against Spontaneous Explosion.—In addition to the two explosions of compressed oxygen already noted (see *Proceedings*, 1906, 810), a third one is now recorded, which, like those occurring at Winterthur and Genoa, was spontaneous, resulting when the operator opened the container with the object of examining its contents. As in the previous cases, the explosion was traced to the oil used for lubricating the various parts of the stop-cock and manometer, the latter being completely destroyed and seriously injuring the operator, whilst the stop-cock and the flask itself remained perfectly intact. To avoid similar accidents the various parts of the armature of the apparatus and containers are now carefully freed from oils or fats that may accidentally adhere to them, and fat-free asbestos is used in place of the latter as lubricant of the joints.—*Pharm. Ztg.*, li, No. 59 (1906), 658; from *Chem. Ind.*, 1906, No. 14.

Peroxides—Determination by Means of Alkaline Hypiodite.—E. Rupp and J. Mielck propose a method for the determination of peroxidized compounds, which is based upon the facility with which the latter are decomposed by an alkaline hypiodite, obtained by mixing solutions of alkaline hydroxide and volumetric solution of iodine. The excess of hypiodite can be determined by acidifying and titrating with decinormal thiosulphate. the method being applied according to the following details:—*Hydrogen Peroxide*; dilute with water until it contains between 0.05 and 0.2 per cent. by weight; to 10–25 Cc. add 5 Cc. of solution of potash (about 6 per cent.) and 25 Cc. of decinormal iodine; shake gently, acidify with dilute hydrochloric acid and titrate at once with decinormal thiosulphate. One Cc. of decinormal iodine indicates 0.0017 Gm. of hydrogen peroxide. *Sodium Perborate.*—Dissolve 0.1 Gm. of the well-mixed sample in 50 Cc. of water; add 10 Cc. of solution of potash, 25 Cc. of decinormal iodine, and treat as before. *Sodium Percarbonate.*—Use 0.3 Gm. and proceed as for sodium perborate. It is advisable to dissolve in ice-cold water, as

otherwise a slight loss of oxygen takes place. *Insoluble Peroxides*.—For these an acid solution is necessary. Dissolve about 0.2 Gm. in 25 Cc. of dilute sulphuric acid, add 25 Cc. of water, 2.0 Gm. of potassium iodide, and titrate the liberated iodine after 10 minutes' standing.—The method is not applicable, however, to preparations of sodium peroxide because of the stormy evolution of oxygen on addition of the reagent.—Arch. d Pharm. 245 (1907), No. 1, 5-12.

Peroxides and Percarbonates—Iodometric Method of Estimation.—F. Rupp and J. Mielck find that the quantitative estimation of peroxides and percarbonates may be rapidly and accurately effected by means of alkaline hypiodite, provided such are soluble in water. The hypiodite is reduced with evolution of oxygen, according to the equation: $M_2O_2 + NaIO = O_2 + NaI + M_2O$. The excess of hypiodite is then ascertained, in the usual manner, by acidulating the product of the reaction, and titrating the liberated iodine with $\frac{N}{10}$ thiosulphate. For example, a solution of hydrogen dioxide is diluted with water to about 0.05-0.2 per cent. (by weight); 25 Cc. of this dilution is rendered alkaline with KOH or NaOH solution (about 5 Cc.) and 25 Cc. of $\frac{N}{10}$ iodine solution is added with gentle rotation. The nearly colorless mixture is then acidulated with (about 10 Cc.) diluted hydrochloric acid, and titrated in the usual manner with $\frac{N}{10}$ thiosulphate (1 Cc. $\frac{N}{10}$ I = .0017 H_2O_2).—Arch. d. Phar. 245 (1907), No. 1, 5.

HYDROGEN.

Water—Purification by Means of Colloidal Ferric Hydroxide.—H. Schweikert recommends a solution of colloidal ferric hydroxide for the purification of water, on the ground that it is completely precipitated with the small quantities of caustic or carbonated alkalies or alkaline earths, as well as with mineral acids, and most of the neutral salts that may be present. Moreover, the ferric hydroxide forms insoluble compounds with most of the organic substances that may be dissolved in the water. The method is practicable on a technical scale by the use of solution of ferric hydroxide, prepared without resorting to dialysis, in accordance with a German patent (No. 173, 733), which is essentially as follows: Dilute solution of ferric chloride, free from sulphate, is gradually treated with sufficient sodium carbonate or bicarbonate to produce a permanent precipitate, leaving the supernatant liquid neutral, or, at most, very faintly acid. The precipitate is carefully and completely washed, subjected to centrifugation, and then dissolved in water. A clear, dark brown-red solution results, which has a faint acid reaction, and when adjusted to the sp. g. 1.050-1.051, contains about 3.5 per cent. of iron. It may be diluted with twenty times its weight of water and heated to boiling, without becoming turbid, and does not react either with potassium sulphocyanide or with potassium iodide. It shows, in fact, all the chemical properties of col-

loidal ferric hydroxide solutions prepared by dialysis. One liter of this solution is sufficient to completely purify 1 cubic meter of water, and being quite inexpensive, it furnishes a cheap and efficient means for purifying the water supply.—Arch. d. Pharm., 245 (1907), No. 1, 12–25.

Drinking Water—Colorimetric Determination of Lead.—Guldensteeden Egeling recommends the following method for determining lead in drinking water colorimetrically: To 100 Cc. of the water, 1 drop each of acetic acid and of solution of potassium chromate (1 : 10) are added, well mixed, and set aside. According to the quantity of lead present turbidity is produced immediately or after standing some time, and this may be compared with solutions of lead of known strength treated in the same way under identical conditions. Not more than 1 drop of the chromate solution should, however, be used in any case, since an excess of this reagent retards the formation of lead chromate. Obviously, the water to be tested must be clear and free from color.—Pharm. Ztg., lii, No. 29 (1907), 301; from Pharm. Weekbl., No. 13, 1907.

Distilled Water—Container for Prescription Use.—Mr. Diner explains his method of keeping distilled water for prescription use. He uses a two-gallon Whitall-Tatum irrigation bottle, like the one in the illustration (Fig. 35) to which is attached a rubber tube. The jar sits at the top of

FIG. 35.



the prescription partition, this elevation insuring a ready flow. Whenever any water is to be drawn off, the nozzle at the end of the tube is inserted in the bottle, and a pressure of the thumb brings the water. Keeping the water in this way permits it to be drawn off with great convenience, and guards against contamination of the water by gases.—Apothecary, March, 1907, 186.

Water—Detection of Small Quantities.—According to F. Scriba delicate test-papers for the detection of water are prepared by dipping paper

in a five per cent. solution of ferrous ammonium sulphate, drying it, and dusting it over with finely powdered potassium ferricyanide. A minute drop of water at once produces a deep blue stain on such paper.—Pharm. Journ., Dec. 1, 1906, 599; from Zeit. f. Physik. Chem. Unterr., 1906, 19, 298, through Chem. Centralbl., 1906, 2, 1458.

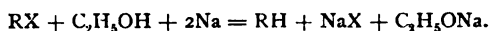
• *Hydrogen Dioxide—Quantitative Estimation.*—According to W. Duliere the well-known permanganate method for the quantitative estimation of hydrogen dioxide is more convenient and exact by the use of a permanganate solution of which 1000 Cc. correspond to 1000 Cc. of active oxygen. Such a solution is obtained by dissolving 5.648 Gm. of permanganate in 1000 Cc. of water. In practice, 1 Cc. of the sample is mixed with 20 Cc. of diluted sulphuric acid and carefully titrated with the permanganate solution, added drop by drop, until a permanent rose color is developed.—Pharm. Journ. lii (1907), No. 19, 191; from Journ. de Pharm. d'Anv., 1907, No. 2.

Hydrogen Dioxide—Sodium and Magnesium Chlorides as Preservatives. To avoid the use of acids as a preservative of solutions of hydrogen dioxide, which is readily decomposed by alkaline media derived from glass containers, it has been proposed to coat the inner surface of the latter with paraffin. Experiments made by Allain have now demonstrated that such solutions are well preserved by the addition of a little sodium chloride or magnesium chloride, the sodium salt being preferable because of its non-interference with the therapeutic uses of the hydrogen dioxide. The addition of 1 per cent. of NaCl is claimed to be ten times more efficient as a preservative than either acids or alcohol—that is to say, it will preserve it ten times longer.—Pharm. Ztg., li, No. 59 (1906), 659; from Journ. de Pharm., et. Chim., xxiv, No. 2. •

Solution of Hydrogen Dioxide—Acetanilide as a Preservative.—The attention of Charles LaWall having been called to several samples of solution of hydrogen dioxide from different sources, all of which had a strong odor resembling nitrobenzol, he found on investigation and by correspondence with manufacturers that this was due to the use of acetanilide as a preservative, and furthermore, that the addition of small quantities of acetanilide is apparently very efficient for this purpose. Several samples which were known to be at least four months old, and originally supposed to contain 10 volumes of H_2O_2 , showed from 9.5 to 10.5 volumes of oxygen. There would probably, therefore, be no objection to the use of small quantities of acetanilide as a preservative of solutions of hydrogen dioxide; but the use of such, and its quantity, should be stated on the label. The presence of acetanilide in the freshly-made and odorless product can be established by shaking out with chloroform and applying the isonitrile test to the residue of evaporation of the chloroformic solution.—Amer. Journ. Pharm., Dec., 1906, 582.

HALOGENS.

Halogens—Determination in Organic Compounds.—A. Stepanoff finds that halogens may be rapidly and quantitatively removed from organic compounds by the following reactions:



The method can be employed for determining the amount of halogen in a compound as follows: A small tube containing from 0.2 to 0.5 Gm. of the substance is placed with 20–40 Cc. of 98 per cent. alcohol in an Erlenmeyer flask connected to a long reflux condenser, and standing on a water-bath. An excess of about twenty-five times as much sodium as is required by the above equation is then added in portions through the reflux condenser. When all the sodium has dissolved 20–40 Cc. of water are added and the alcohol is distilled off; the solution is then acidified by means of dilute nitric acid, and the amount of chloride is estimated by titration. The author has carried out a large number of analyses of halogen derivatives of benzene, toluene, and naphthalene by this method, and has obtained very accurate results.—Pharm. Journ., Jan. 5, 1907, 9; from *Berichte*, 1906, 39, 4056.

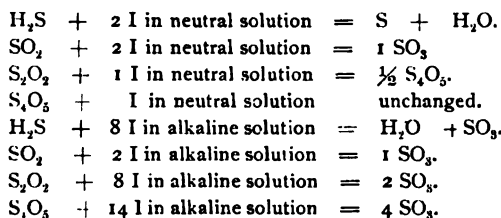
Bromine Chloride—Questionable Existence.—The investigations of Paul Lebeau lead him to the conclusion that the compound hitherto known as bromine chloride does not exist, the constant composition of the mixture being due to the circumstances of its formation. In fact, it corresponds to the solubility of chlorine in bromine at the temperature of 0°. No other combinations take place by the direct action of chlorine on bromine. The crystals which are obtained by sufficiently cooling a solution of bromine in liquid chlorine have a composition depending on their temperature of formation, and they are proved to be merely mixed crystals of chlorine and bromine.—Chem. News, Nov. 16, 1906, 241; from *Compt. rend.*, 143 (1906), No. 17.

Rock Salt—Cause of Blue Color.—Dr. Ernst Pieszczyk discusses the source of the blue color of rock salt, which by some authorities is attributed to the presence of infinitesimally small particles of metallic sodium, in form of needles or lamellæ, while others consider the excess of metal above the theoretical quantity to be due to the existence of subchloride, which, as demonstrated by H. Rose, Bunsen and Kirchhoff, and by Würtz-Fittig, is obtainable under certain conditions in the form of a handsome ultramarine-blue compound. Although originally inclining with Siedentopf's and Stähle's view of metallic sodium as the cause of blue color, recent experiments of Ochsenius render it more probable, and incline the author to the opinion, that the blue color of rock salt is due to the presence of sodium in chemical combination as subchloride.—Pharm. Ztg., li, No. 63 (1906), 700.

Japanese Iodine—Source, etc.—A. M. Ossenderoski states that the

manufacture of iodine in Japan, which is widely practiced throughout the Empire, is confined almost exclusively to the use of aquatic plants abounding on the shores of the Japanese archipelago, the freshly gathered plants as well as such that have been cast ashore and undergone decomposition supplying the material. The seaweeds occurring in the northern part of Japan are: *Fucus vesiculosus*, containing 0.741 per cent. I., and *Laminaria stenophylla*, containing 0.4235 per cent. I.; in the southern portions, *Fucus serratus* (0.7965 per cent. I.), *Fucus digitatus* (1.2012 per cent. I.), and *Laminaria saccharina* (0.4174 per cent. I.), furnish the material. The residues remaining after the extraction of the iodine, containing 3.8 per cent. of nitrogen, 10 per cent. of potassium, and 55 per cent. of phosphoric acid, are used as fertilizers. Japanese iodine always contains about 0.6 per cent. of sodium and potassium iodides.—Pharm. Journ.

Iodometric Determinations—Extension of the Method.—In a paper read before the Meeting of German Naturalists and Physicians at Stuttgart (Sept., 1906), Prof. E. Rupp strongly advocates the extension of iodometric determinations. In view of the fact that the oxidizing effect of iodine is the more intense in the degree of the more complete interception of the H^- ions evolved, the author assumed that the oxidizing action of iodine must be strongest in caustic alkaline solution, into which the neutralizer itself directly supplies hydroxyl-ions. This assumption proved to be correct. Thus, while cyan-hydrogen is not affected by iodine in acid solution, and by iodine in solution with a bicarbonate is simply converted into cyanogen iodide, it is oxidized in caustic alkali solution into cyanic acid. In the case of sulphocyan-hydrogen the reactions are similar, and in a similar manner it becomes possible to determine and separate sulphides, sulphites, thiosulphates and tetrathionates, their reactions with iodine being exhibited in the following:



It is possible therefore by carrying out both titrations to obtain two titration-values from which the content of each can be calculated, and under circumstances, by continuing the oxidation of the neutral titration mixture in alkaline solution, to obtain a third value from which three of the above-named components may be estimated in their admixtures. The author gives a number of practical examples covering the iodometric method as applied to the estimation of sulphite and thiosulphate, water-soluble peroxides, ferrous salts, iodides in presence of Cl and Br, arsenic or

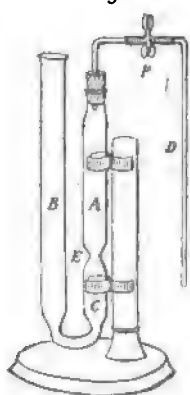
antimony and tin, and to bismuth, mercury and silver solutions after reduction to the elementary state with formaldehyde, etc., etc.—Pharm. Ztg., li, No. 77 (1906), 849–850.

Hydrofluosilicic Acid—Titration.—In the course of testing for fluorine the waters of the Burtscheid Springs, which contain large amounts of sulphur, N. Sahlbom and F. Willy Hinrichsen determined the fluorine by titrating the hydrofluosilicic acid formed on treating the silicon fluoride with water. They found that hydrofluosilicic acid is very readily split up hydrolytically in presence of alkalis, forming hydrofluoric acid and silicic acid. If, then, care is taken, by precipitating with alcohol, to remove the potassium or barium salt from the further action of the hydroxyl ions, the acid can be titrated directly as a dibasic acid, according to the equation $\text{H}_2\text{SiF}_6 + 2\text{KOH} = \text{K}_2\text{SiF}_6 + 2\text{H}_2\text{O}$. If the solution is warmed on the water-bath the titration can be performed with caustic soda without further addition of alcohol. In this case the reaction proceeds according to the equation $\text{H}_2\text{SiF}_6 + 6\text{KOH} = 6\text{KF} + \text{Si}(\text{OH})_4 + 2\text{H}_2\text{O}$. Thus, for every atom of fluorine one molecule of alkali is used. Phenolphthalein or litmus can be used as an indicator. Employing this method, the authors found that the waters examined contain only 0.0008 Gm. of fluorine per liter.—Chem. News, Nov. 16, 1906, 241; from Ber. d. D. Chem. Ges., xxxix (1906), No. 12.

SULPHUR.

Hydrogen Sulphide—New and Efficient Apparatus.—F. Ranwez has devised the apparatus shown by Fig. 36, for the convenient preparation of hydrogen sulphide. It consists of a U-shaped glass tube, *A, B, C*, con-

FIG. 36.



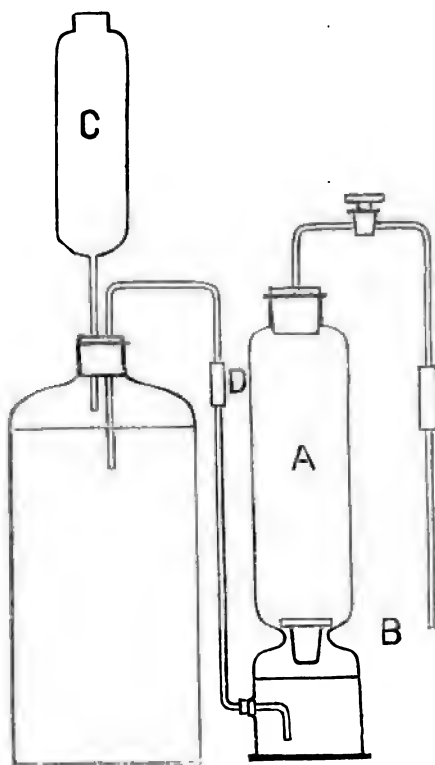
New Apparatus.

stricted at *E* for the reception of a plug of cotton. Ferrous sulphide (30–50 Gm.) is placed in *A*, which should be just half filled; and which is then closed with a stopper bearing a tube, provided with a pinchcock, *P*. The diluted acid (100 to 120 Cc.) is introduced into *B*, *P* being closed. When the pinchcock is opened the acid rises in *A*, and coming into contact with the ferrous sulphide, evolves a steady stream of hydrogen sulphide. On closing the pinchcock the gas evolved forces the acid back into *B* and out of contact with the ferrous sulphide, whereupon the further evolution of gas ceases.—Merck's Rep., Mar., 1907, 79; from Chem. Ztg., Rep., xxx, 473.

Gas Generator—Improved Construction.—F. South-erden recommends the gas generator shown by Fig. 37, the general construction of which requires little explanation. *A* is a "lime tower," about 12 in. high, the upper portion of which is packed with the solid reagent, a flat stopper, with the

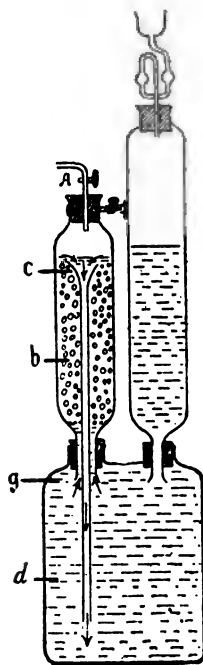
top partially chipped away, fitting quite loosely at *B*. The liquid reagent is contained in a "Winchester quart" bottle connected to *A* by a syphon tube, and since the tube does not reach far below the surface of the liquid, fresh liquid always syphons into *A*, the denser spent liquor sinking, as returned, towards the bottom of the reservoir. The stem of the funnel, *C*, reaches to such a point that, as the liquid sinks in the lower bulb of *A*,

FIG. 37.



Southerden Gas Generator.

FIG. 38.



Steiger Improved Gas Generator.

the corresponding rise of level in the reservoir causes the liquid to enter the funnel, so that if through vigorous action the syphon empties, it automatically refills when next required. Should the tap be left turned on, only the liquid in *A* becomes exhausted, and to re-start it is merely necessary to slope the whole apparatus, so that most of the liquid syphons back into the reservoir—the rubber tube *D* forming a flexible joint in the connection of the two vessels.—Chem. News, May 3, 1907, 207.

Gas Generator—Improved Form.—E. Steiger has devised a new form of gas generator which possesses a number of advantages over the forms

ordinarily used. The new apparatus is shown in the cut, Fig. 38. On opening the cock, *a*, the acid enters the vessel, *b*, filled with zinc or iron sulphide, and an immediate evolution of gas ensues. The particles of acid carried along by the bubbles of gas fall into the funnel tube, *c*, and are conducted to the bottom of the vessel, *d*, the acid flowing from the end of tube in a clearly-defined stream, which settles at the bottom and displaces fresh acid which is forced up through *g* to act on the zinc or iron sulphide. The circulation of the acid effects not only a vigorous evolution of gas, but as complete a utilization of the acid as possible. Comparative tests made with a similar apparatus without the funnel tube showed that whereas such an apparatus yielded only 5 liters of hydrogen in five minutes, an apparatus provided with the funnel tube afforded 15 liters of gas in a like period.—Merck's Rep., Nov., 1906, 335; from Chem. Ztg., xxx, 835.

Thiosulphates—Isomeric Double Salts.—Julius Meyer and H. Eggeling have determined that two isomeric potassium sodium thiosulphates can be obtained in one of which the sodium, and in the other the potassium, is directly bound to the sulphur. Thus the formulæ are $\text{KS.SO}_2.\text{ONa}$ and $\text{NaS.SO}_2.\text{OK}$. Exactly the same isomerism is exhibited by some double salts with heavy metals, the heavy metal being bound with the sulphur in one case and with the oxygen in the other. The silver alkali thiosulphates containing ammonia can yield yellow salts with the stronger alkalies; these are analogous to the yellow copper salts in which the copper is undoubtedly monovalent. Thus the allied elements, silver and copper, form yellow alkali double thiosulphates, as well as white salts, which are possibly isomeric, the formulæ being $\text{AgS.SO}_2.\text{O}$ and $\text{CuS.SO}_2.\text{O}$, or $\text{AgO.SO}_2.\text{S}$ and $\text{CuO.SO}_2.\text{S}$. Most double thiosulphates are not stable, and only the silver and lead salts of the stronger alkalies can be kept without undergoing decomposition. Moreover, the heavy metal salts decompose if any attempt is made to re-crystallize them from water, and hence some metals can be precipitated from their hot solutions by thiosulphate solution instead of hydrogen sulphide.—Chem. News, May 10, 1907, 227; from Ber. d. D. Chem. Ges., xl (1907), No. 6.

Sulphurous Acid—Extemporaneous Formula and Process.—F. L. Cheney, after numerous experiments having in view the extemporaneous preparation of sulphurous acid by a process similar to that of compound solution of chlorine, finds the following, after repeated trials, to give the best results: Dry acid sodium sulphite, 5.7 Gm.; dilute hydrochloric acid, 18.5 Cc.; water, 25 Cc. Add the acid to the salt placed in a fair-sized (8 ounce), glass-stoppered bottle, quickly stopper and set aside in a cool place. Agitate slightly to aid solution of the salt and when effervescence ceases add the water and agitate for a few minutes. The product should measure 40 Cc. and assay from 6 per cent. to 6.5 per cent. SO_2 .—Amer. Journ. Pharm., July, 1906, 333.

Sulphates—Volumetric Determination.—Prof. Henry Leffmann recommends a volumetric method for the determination of sulphates, which depends on the sparing solubility of benzadine sulphate in water and acids, and that benzadine chloride, used as reagent, can be titrated like a free acid with sodium hydroxide, using phenolphalein as indicator.—Proc. Penna. Pharm. Assoc., 1906, 161.

NITROGEN.

Atmospheric Nitrogen—Industrial Importance of its Electro-chemical Fixation.—Philippe A. Guye, discussing the electro-chemical problem of the fixation of nitrogen, observes that in view of the approaching exhaustion of the supply of Chili saltpetre, and the fact that the amount of ammonium sulphate at present produced is not sufficient to supply the ever-increasing demand of nitrogen for agricultural purposes, the commercially successful achievement of the fixation of atmospheric nitrogen is of the utmost importance. The author has calculated the value of 1 kilo. of nitrogen in the form either of Chili saltpetre, ammonium sulphate, or nitric acid to be one shilling and threepence, one shilling and twopence-halfpenny, and one shilling and sevenpence-halfpenny respectively. The price of the same weight of nitrogen in the form of calcium cyanamide (which see under *Cyanogen*) works out at a shilling and threepence halfpenny. It is found that by employing a high temperature for the combustion of atmospheric nitrogen by means of the electric arc, the yield of nitric oxide is increased, and the transformation takes place more rapidly. Owing, however, to the tendency of the nitric oxide to be dissociated at high temperatures into nitrogen and oxygen, the success of the process depends on the rapid cooling of the oxide. This has been realized in practice by rapidly sweeping the gases out of the region of the electric arc, and more recently use has been made of mechanical devices by which arcs were successfully lighted and interrupted several thousand times per second, or the arc has been forced to play in different regions of the space. The gases as they pass out of the arc chamber contain some 1 or 2 per cent. by volume of nitric oxide; by allowing the gas to cool to about 500° to 600° the nitric oxide is converted into nitrogen trioxide and peroxide, which are then absorbed in water. The cost price of 1 kilo. of nitrogen fixed by this process works out at either one shilling or elevenpence-halfpenny, according as it is sold in the form of calcium nitrate or nitric acid.—Pharm. Journ., Oct. 20, 1906; from J. Soc. Chem. Ind., 1906, 25, 567-578.

Nitrogen—Determination.—F. H. Alcock observes that scattered throughout the pages of the books devoted to drugs will be found figures representing the amount of total nitrogen present in common drugs, but, except in a few instances, no reference is made to the process by which the results were obtained. He has made a large number of nitrogen de-

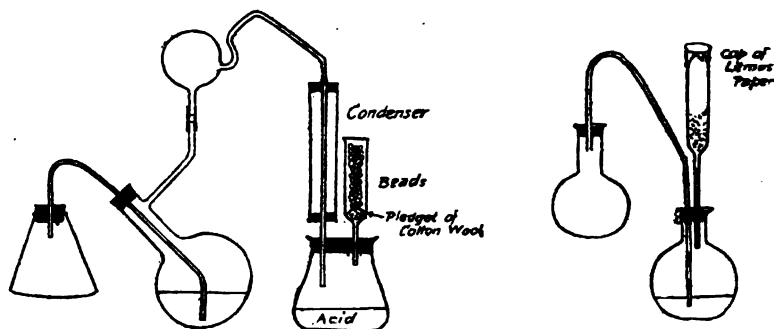
terminations in a variety of drugs, representing seeds, leaves, barks, roots, corms and bulbs, woods, flowers, fruits, juices, animal drugs, etc., and communicates the amounts of nitrogen determined by a modification of the Kjeldahl method, which he describes as follows:

Five Gm. of drug was taken and placed in a $\frac{1}{2}$ -liter Jena glass flask and warmed gently with 40 Cc. of pure strong sulphuric acid, sp. gr. 1.843. After charring had ensued 30 Cc. more acid was added, together with 10 Gm. of potassium sulphate, and the whole boiled in the fume-chamber until the color of the char gave place to a white or very pale yellow colored liquid, this occupying a varying period of from six to twelve hours, the final volume being about 50 Cc. Dilution with 500 Cc. distilled water followed, excess of a very strong solution of pure sodium hydrate being then added, and distillation of the ammonia gas into standard normal sulphuric acid—the usual quantity being 20 Cc. diluted with 20 Cc. of distilled water, except in a few cases, where 40 Cc. of acid was used, and in two instances 60 Cc.—Trans. Brit. Pharm. Conf. (Year-book of Pharmacy), 1906, 284–287.

Kjeldahl Nitrogen Apparatus—Improved Modification.—Supplementing Mr. Alcock's paper on the determination of nitrogen in common drugs, the "Chemist and Druggist" publishes the cuts shown by Figs. 39 and 40,

FIG. 39.

FIG. 40.



Kjeldahl Nitrogen Apparatus.

Fig. 39 being the apparatus employed by Mr. Alcock, while Fig. 40 represents a modification of the Kjeldahl nitrogen apparatus, which was sketched by Mr. J. F. Liversseege on the board during the discussion following the reading of the paper. The latter apparatus has been found to trap the ammonia very perfectly.—Chem. and Drugg., Aug. 25, 1906, 332.

Hydrazoic Acid—Preparation and Characters.—L. M. Dennis and Helen Isham have prepared anhydrous hydrazoic acid by adding dilute sulphuric acid (two parts acid to one part water) to potassium trinitride in a current of dry carbon dioxide. The free acid was dried by passing it

through calcium chloride tubes and collected in a vessel which was surrounded by a Dewar's vessel containing liquid air. The whole apparatus was placed behind a screen of thick plate-glass before which were wooden walls, and other precautions were taken to ensure the safety of the operator. The temperature was ascertained by means of a pyrometer. The acid yielded a white crystalline mass which slowly melted when the liquid air was allowed to evaporate. The melting-point was found to be -80°C . and the boiling-point about 37°C . The acid is a colorless mobile liquid which is heavier than water, and probably has a high surface tension. At ordinary temperature it is apparently quite stable, but explodes readily and with great violence if it is shaken or strongly heated. The authors succeeded in analyzing the anhydrous acid, and found its vapor density; the latter at a temperature only 25° above the boiling-point indicates that the compound has the mono-molecular formula HN_3 .—Chem. News, April 5, 1907, 167; from Ber. d. D. Chem. Ges., xl (1907), No. 2.

Barium Nitrite—Preparation.—J. Matuschek observes that in preparing barium nitrite the water present for the reaction between the barium chloride and sodium nitrite, in molecular proportions, must be in the minimum quantity requisite to hold the theoretical yield in solution. This condition at the same time prevents the presence of sodium chloride to a great extent. 200 Gm. of crystallized barium chloride and 113.6 Gm. of sodium nitrite are intimately mixed together, placed in an apparatus in which the temperature during the whole treatment can be maintained at 100°C ., and 60 Gm. of water added. When reaction is complete, the solution formed is filtered off by suction aided by compression of the solid residue, and on cooling yields 163 Gm. (80.5 per cent. of the theoretical amount) of crystals, which, after washing with a saturated solution of barium nitrite, are practically pure barium nitrite. The mother-liquor can be used in a second operation, and thus practically the theoretical yield of nitrite be obtained.—Pharm. Journ., June 15, 1907, 779; from Berichte, 40 (1907), 990.

Nitrates—A New and Direct Precipitant.—Prof. Henry Leffmann calls attention to a precipitant for nitrates, discovered by M. Busch, which enables the direct determination of nitrates in water, whereas all previous methods, however convenient and satisfactory, were indirect and circumstantial. The new compound is a complex pyrrol derivative, "diphenyl-endanilo-dihydro-triazol," which has wisely been named

"*Nitron*," and is sold under this name. It is a bright yellow, soft, crystalline powder, sparingly soluble in water, more freely in dilute acids, and best employed as reagent in form of a 1 per cent. solution in 5 per cent. acetic acid, which, though keeping for some time, should not be prepared in quantities. When this solution is added to a liquid containing notable quantities of nitrates, a white flocculent precipitate forms promptly,

but with dilute solutions the liquid should be cooled to 0° C. Chlorides, sulphates and carbonates do not interfere. The interfering substances—such as bromides, iodides, chlorides, perchlorates, and complex cyanides—do not commonly occur with nitrates, and most of these can be easily detected and removed.—Proc. Penna. Assoc., 1906, 160.

Nitric Acid—Interference of Nitrous Acid with the Diphenylamine and Brucine Reactions.—P. Soltsien, in view of the statements in the literature that the presence of nitrous acid does not interfere with the tests for nitric acid commonly in use, has subjected the diphenylamine and the brucine reactions for the presence of nitric acid to critical investigation. He finds that the diphenylamine reaction is not produced by nitrous acid; but on the other hand the presence of much nitrous acid with little nitric acid will prevent the reaction for the latter completely. The brucine reaction for nitric acid is also very materially interfered with by the presence of nitrous acid. While a distinct reaction is obtainable in a liquid containing 0.01 Gm. of N_2O_3 in a liter, when mixed with a little brucine solution and superimposed on a layer of sulphuric acid, this reaction (development of a red ring at the point of contact of the two liquids) is prevented entirely or becomes indistinct in the presence of nitrous acid. At best, the reaction with nitrous acid produces a yellow-red color, changing rapidly to yellow, whereas with nitric acid there is a transition from red-yellow which slowly changes to yellow. Moreover, in the latter case the red nitric acid reaction with brucine may be repeatedly obtained by gently swinging the test-tube, while with nitrous acid this is impossible.—Pharm. Ztg., li, 69 (1906), 765.

Nitric Acid—New Color Reactions.—C. Reichard finds that if a small quantity of pure arbutin is moistened on a porcelain or glass plate with a trace of nitric acid, the previously white substance acquires an intensely yellow color. The same reaction results if a little concentrated sulphuric acid is added to a mixture of arbutin and a nitrate which has previously been moistened with a little water. The addition of sulphuric acid also becomes necessary if very dilute nitric acid is to be determined by means of arbutin. The test is distinctly available with 0.00015 Gm. KNO_3 , corresponding to about 0.0001 Gm. HNO_3 . A characteristic color reaction is also obtained with berberin. On moistening a little berberin hydrochloride with a drop of 20-per cent. nitric acid, no apparent change results; but if the porcelain plate is gradually and gently heated, the original yellow color of the salts changes to an intense red-brown color, which remains unchanged and is permanent after drying. More concentrated acid produces a deeper color—up to nearly black—while even very dilute acids produce a distinct red color.—Pharm. Ztg., li, No. 71 (1906), 787; from Chem. Ztg., 1906, No. 65.

Nitric Acid—Determination in Hydrochloric Acid.—N. Gottlieb recom-

mends the determination of small quantities of nitric acid in hydrochloric acid by the aid of Lunge's nitrometer, the method being the same as that described by Lunge for the determination of nitric or nitrous acid in sulphuric acid, but using pure 20° hydrochloric acid in place of sulphuric acid for rinsing the beaker. The test is made by introducing 5 Cc. of the hydrochloric acid to be examined into the beaker of the nitrometer (or 10 Cc. if very weak); then rinsing the beaker twice with 1-2 Cc. of pure 20° hydrochloric acid, and then inciting the evolution of gas in the usual way. The author has obtained very satisfactory results with acids containing as little as 0.01 to 0.5 per cent. HNO_3 , and the method has the further advantage of being rapidly carried out.—Pharm. Ztg., li, No. 70 (1906), 777; from Chem. Ztg., 1906, No. 63.

PHOSPHORUS.

Red Phosphorus—Luminosity.—The investigations of A. Siemens determine that amorphous (red) phosphorus becomes luminous, like ordinary (yellow) phosphorus when the well-known Mitscherlich test (boiling the phosphorus in an acid medium in the dark) is applied, which has hitherto been regarded as characteristic of the yellow modification. He finds that if the boiling-flask is heated so rapidly that the liquid is brought to boiling almost instantaneously, bright luminosity manifests itself in the flask even in the case of red phosphorus which has been repeatedly extracted with carbon disulphide to insure the complete absence of yellow phosphorus. The oxidation products of the two modifications of phosphorus are also the same, the luminosity of both depending on the formation of a volatile lower oxide; but the oxidizability of the red modification is not as great as is that of the yellow modification at the ordinary temperature, until a temperature of 90° is reached. Furthermore, the author finds that red phosphorus is not converted into the yellow modification by violent agitation, as has been assumed, but that by such, or by trituration, it is simply reduced to a finer state of aggregation, in which condition it becomes more soluble and reactive than in its original condition. Finally, the author proposes and describes a method for the detection of yellow phosphorus in the red phosphorus of commerce, depending upon the property of the dissolved phosphorus to reduce the metals from certain solutions of metallic salts, which must be consulted in the original, in Arb. aus d. Kais. Ges.-Amt., vol. 24, No. 2.—Pharm. Ztg., li, No. 89 (1906), 986.

Phosphoric Acid, B. P.—Volumetric Estimation.—Referring to a suggestion of Dr. Attfield in his "Digest of Researches and Criticisms," concerning phosphoric acid, "that if qualitative tests showed freedom from impurities, a standard soda solution, employed with phenolphthalein, or some such volumetric operation, might perhaps serve for quantitative purposes," R. C. Cowley observes that it is difficult to assign a reason for the position given in the B. P. to the quantitative test depending on the use

of lead oxide for determining the P_2O_5 in the concentrated acid. The defects inherent to this method have also been pointed out by Dr. Attfield, and the process becomes absolutely useless in the presence of non-volatile impurities, which would be calculated as P_2O_5 . Mr. Cowley does not presume to decide in what degree the presence of small quantities of alkaline impurities affect the utility of the acid for pharmaceutical purposes. He considers it, however, of much greater importance that it should have a correct proportion of real phosphoric acid, and for this purpose regards a volumetric process indispensable. The one suggested by Dr. Attfield is easy of application, and shows a sharp change in color when the second atom of hydrogen in the phosphoric acid is displaced by the alkali in a boiling liquid. Under certain circumstances for the rough estimation of non-volatile impurities, a combination of both processes may be useful.—Pharm. Journ., Nov. 17, 1906, 541.

Phosphoric Acid—Quantitative Sublimation from its Salts.—It has been observed that when phosphoric acid is determined by distilling a mixture of phosphate and carbon in a current of chlorine the results are not satisfactory. P. Jannasch and S. Heimann now find, however, that if an intimate mixture of phosphate and carbon is made by separating the latter from a sugar solution in the distilling flask by means of sulphuric acid the phosphoric acid distils over quantitatively. This method was first tried with ammonium phosphate, when 99.65 per cent. of the phosphoric acid distilled over; it was then applied to phosphates of the fixed bases, magnesium phosphate being used, and the results were equally satisfactory, after the distillation has been repeated several times.—Chem. News, Nov. 16, 1906, 242; from Ber. d. D. Chem. Ges., xxxix (1906), No. 12.

Syrupy Phosphoric Acid—Examination of English Samples.—T. G. Joyce reports the results of an examination of four samples of syrupy phosphoric acid of different makes found on the English market, which are shown in the following table:

No.	1.	2.	3.	4.
Specific gravity at 15.5° C.	1.750	1.765	1.746	1.741
Arsenium, per cent.	0.00013	0.00000	0.00000	0.00011
Sulphuric acid, per cent.	0.0000	0.0081	0.0154	0.0235
Hydrochloric acid, per cent.	0.0000	0.0000	0.0000	0.0000
Phosphorous acid	Heavy traces	Traces	Traces	None found
Nitric acid	None found	None found	None found	None found
Metaphosphoric acid				
Pyrophosphoric acid				
Silica.				
Heavy metals				

It is evident that in Nos. 2 and 3 the absence of arsenium has been in-

sured by the introduction of sulphuric acid, while in sample No. 4, both arsenium and sulphuric acid are present.—Pharm. Journ., August 4, 1906, 145.

Sodium Phosphate—Arsenic in Commercial Samples.—Of nine samples of sodium phosphate examined by C. C. Shomo, one gave a decided test for arsenic and five gave evidence of slight traces of the poison. One sample gave the reaction for iron, six samples showed evidence of chlorides, and eight contained calcium. All gave tests for sulphates, and none contained the full amount of water of crystallization, which ranged from 20.1 per cent. to 51.7 per cent., with an average of 39.5 per cent. as against 60.3 per cent. officially required for the crystallized salt.—Amer. Journ. Pharm., Sept., 1906, 416.

BORON.

Boric Acid.—Estimation by means of *Turmeric Paper*, which see under "Pharmacy."

Boric Acid—Detection and Estimation.—Charles H. LaWall and H. A. Bradshaw find that while the turmeric paper test for boric acid is not sufficiently delicate for estimating or detecting small quantities, tincture of turmeric prepared as officially directed in the list of indicators, U. S. P. VIII, affords a very satisfactory and sensitive reagent if applied as follows: The liquid under examination is poured into a small watch-glass, carefully acidulated with 10 per cent. HCl for faint acid reaction on blue litmus, and then about five drops of tincture of turmeric are added and the liquid evaporated to dryness on a water-bath. If boric acid is present the residual film produced will have a red color directly proportionate to its amount, which may be approximately determined by comparison with the color produced under the same conditions with known quantities of boric acid. It is essential that the liquid should produce a film on evaporation. If such is not produced, a film may be secured by the addition of a five-per cent. solution of gelatin, but in this case it is necessary to make also a blank experiment with gelatin alone. The test is available in the presence of 1–20,000, and possibly even with 1–50,000 boric acid.—Proc. Penna. Pharm. Assoc., 1906, 168–171.

Boric Acid and Borax—Commercial Quality.—F. A. Butler has found the purity of seven samples of commercial *boric acid* to vary from 92.39 per cent. to 98.47 per cent. of absolute acid, the average being 94.82 per cent. Three of the samples contained traces of sulphuric acid. Four samples of *borax* assayed 88.12 per cent. to 98.47 per cent. of pure sodium borate, the average being 91.83 per cent.—Amer. Journ. Pharm., Sept., 1906, 417.

Sodium Perborate—Convenient Process of Preparation.—F. P. Robinson suggests the following formula and process for preparing sodium perborate conveniently:

Sodium borate.....	5 Gm.
Solution hydrogen dioxide.....	75 Cc.
Solution sodium hydroxide, 5 p c.....	60 Cc.
Distilled water.	30 Cc.

Dissolve the sodium borate in 30 Cc. of boiling distilled water, cool, add the solution of sodium hydroxide, then the solution of hydrogen dioxide, and set aside for twenty-four hours to permit the crystals of sodium perborate to form. Wash the crystals with several changes of distilled water, and collect and dry them on bibulous paper. The product may be tested as follows: Dissolve a few crystals in diluted hydrochloric acid, pour a layer of ether over the solution, and add solution of potassium dichromate drop by drop. Perchromic acid is instantly formed, which dissolves in the ether and imparts to it a beautiful blue color.—Pract. Drugg., July, 1906, 452; from Bull. Pharm.

A New Glass—Production from Lithium Biborate.—F. A. and C. L. Lindemann describe a new glass which is transparent to rays of very short wave-length. They have found that lithium biborate, $\text{Li}_2\text{B}_4\text{O}_7$ (ordinary borax in which the sodium is replaced by lithium), when fused produces a clear glass which shows no appreciable absorption in the ultra-violet spectrum above 2000 A° . The aluminum line 1856 is distinctly visible, though somewhat weakened if the glass be too thick. In order to determine the absorption below this a vacuum spectrograph would naturally be required, as the air absorbs any lines shorter than 1856. The glass is extremely transparent to Röntgen rays, which it lets through, roughly, ten times as well as ordinary glass. The specific gravity is 2.2; the hardness 6. The glass can be cut and polished without difficulty. The cubical expansion coefficient (calculated from the constants of Winkelmann and Schott) is 118.10, about half that of ordinary glass. It has been found that, as a general rule, the transparency for rays of short wave-length increases in analogous salts as the atomic weight of the metal decreases, but sufficient experimental data have not yet been obtained to warrant the publication of a definite formula.—Pharm. Journ., June 1, 1907, 723; from Nature, 1907, 75, 614.

SILICON.

Fused Silica—Use for Making Chemical Apparatus.—The "Chemical News" observes that the scientific work of which the process of manufacturing apparatus for chemists' use from fused silica is the outcome, was carried out by two eminent English scientific men about ten years ago, but that unfortunately its commercial importance was first recognized in Germany, and its production on an industrial scale was the result. An English firm has now taken up the original process, and by suitable modifications to meet industrial requirements are now enabled to place this material upon the market at a price which can no longer be considered

prohibitive. The apparatus is manufactured from the purest silica obtainable. At a high temperature this substance melts and yields a viscid liquid which can by suitable means be fashioned into apparatus having all the appearance of ordinary glass. It possesses many properties which are likely to render it of immense service both to science and to industry, *e. g.*, it can be heated white hot and plunged into water, or otherwise rapidly cooled, without any danger of cracking; it is quite unattacked by water or acids, ordinary glass under similar conditions being appreciably dissolved.—Chem. News, May 17, 1907, 238.

Tabaschir (Tabasheer)—A "Gem" of the Vegetable Kingdom.—Dr. Georg Gentner contributes an interesting paper on the remarkable silician deposit which is now and then found in the hollow stems of different species of bamboo—particularly *Bambusa arundinacea*—and which, under the name of tabaschir, continues to enjoy a high reputation in modern oriental medicine (see Proceedings, 1896, 532), notwithstanding that it has almost completely disappeared from the ordinary channel of European commerce. Tabaschir has indeed enjoyed a high reputation in ancient times, but it is of interest modernly chiefly because of its peculiar physical characters and chemical composition, and because the word "saccharum" was originally applied to this substance, and not, as is generally supposed, to sugar. There is no doubt that Pliny, Dioscorides, Galen and others, applied the term saccharum to this substance, and that at a much later period this term was appropriated by the Arabs to designate crystalline cane sugar. According to the recent work of Ferdinand Cohn, who succeeded in collecting quite a quantity of this rare drug, tabaschir occurs in pieces of the length and thickness of a child's finger to that of a man's thumb, more or less cylindrical in shape, and often napiform. It is mainly composed of amorphous silicic acid, together with more or less lime (up to 30 per cent.), and traces of organic matter. When first removed from the plant, the drug is hydrous and transparent, resembling large pieces of gum arabic, but varying in color from nearly colorless to brown or even black. On exposure to air it loses water, breaks up into small cap-shaped or conchoidal pieces, and becomes coated with a white, chalk-like efflorescence. It becomes completely amorphous and anhydrous by calcination, and is usually found in commerce in this condition; but in its anhydrous condition it absorbs water with such vehemence, that when immersed in it, it will break up into small fragments with detonating and explosive violence, and in the degree of the absorption of water, again becomes transparent. Other liquids, such as volatile and fixed oils, are absorbed by anhydrous tabaschir, with the same or even greater avidity, and the tabaschir saturated with these oils then assumes a transparency and refractive power which is equal in brilliancy to that of natural gems. Similar effects are produced by acids, that of hydrochloric acid, for instance, being to convert it into a substance of greater density and so hard

as to scratch glass, notwithstanding that in its natural condition it may be easily cut with a knife. The experiments of Cohn fully confirm the observations of David Brewster, who, in 1828, pronounced tabaschir—the “saccharum” of the ancients—to be one of the most remarkable substances found in nature, to which the designation “a gem of the vegetable kingdom” might properly be applied.—Pharm. Ztg., li, No. 54 (1906), 601.

CYANOGEN.

Cyanogen—Improved Preparation for Lecture Demonstration.—In order to remedy certain defects encountered in the demonstration of the “beautiful peach-blossom colored flame” (Attfield) or “a characteristic peach-colored flame” (B. P.) of burning cyanogen, as ordinarily carried out. F. H. Alcock recommends the following plan, which secures a steady flowing and burning gas, and is particularly adapted for lecture experiments and the use of students. Using crystalline mercuric cyanide, which is best prepared by the action of diluted hydrocyanic acid on mercuric oxide and evaporation to dryness, this is introduced into a V-shaped combustion tube, which is then sealed at one end and pointed at the other. The salt is then heated at the curvature: the gas collects at the closed end, and getting under pressure is slowly evolved at the pointed end, when it can be burnt through the medium of the fine orifice with regularity and at a slow rate.—Pharm. Journ., Sept. 15, 1906, 300.

Hydrocyanic Acid—Sources of Error in Toxicological Determinations.—According to the experiments of D. Ganassini the assumption frequently entertained that hydrocyanic acid may result from the decomposition of sulphocyanogen compounds which naturally exist in the animal organism is not justified, because on the distillation of dilute, aqueous solutions of potassium sulphocyanide, even in the presence of acids or animal matter, at most only some sulphocyanic acid is formed, which, however, is at once decomposed into NH_3 , H_2S and CO_2 . On the other hand, hydrocyanic acid may be produced under certain conditions which obtain during the heating of blood or animal organs with water in the presence of tartaric acid. Under such conditions it can scarcely be avoided that a portion of the albuminoid matter in the substance under treatment will come in contact with the heated glass surface and is thus subjected to the action of dry heat, and it is well known that albuminoid substances and their derivatives (xanthin bodies, etc.) yield by direct action of high temperatures, besides other decomposition products, also hydrocyanic acid. Indeed, in the case of haematin, a temperature of 200°C . is sufficient to cause the formation of hydrocyanic acid, which is recognized by the appearance of minute brown dots. Such untoward decomposition is, however, avoided if the distillation in toxicological examinations is conducted with steam, which keeps the mass in continuous motion, and about 50 Cc. of distillate

having been collected, this is tested for CNH in the usual manner.—Pharm. Ztg., lii (1907), No. 12, 116; from Bull. Chim. Farm., 1906, 745.

Calcium Cyanamide—Production from Atmospheric Nitrogen and Industrial Uses.—Adolph Frank directs attention to the industrial importance of calcium cyanamide obtainable by the employment of atmospheric nitrogen. He says, when barium carbonate is heated in an atmosphere of nitrogen to about $1,000^{\circ}\text{C}.$, it is converted into a mixture of barium cyanide and barium cyanamide; calcium carbide on the other hand gives, under the same conditions, only calcium cyanamide. The latter substance containing in the raw state 20 per cent. of nitrogen, is considered to be as good as ammonium sulphate for agricultural purposes; in contact with moist earth and carbon dioxide it is converted by the help of certain bacteria into calcium carbonate and cyanamide, which then probably passes into urea, ammonia, and finally into nitric acid; in the absence of all bacteria these changes take place much more slowly. Calcium cyanamide may also be used as the starting-point for the preparation of ammonia and its salts, of cyanamide, urea, dicyandiamide, dicyanamide and of guanidine; it also finds application in the preparation of indigo by the fusion of the alkali salts of cyanamide with phenylglycine and in the hardening of iron. Dicyandiamide added to explosives, lowers their combustion temperatures.—Pharm. Journ., Oct. 13, 1906, 413; from Zeit. angew. Chem., 1906, 19, 835–840.

ALKALIES.

Alkali Metals—Colloidal Form.—While the production of aqueous solutions of colloidal alkali metals is out of the question, it is found by Siedentopf quite possible to secure an ultra-microscopic division of sodium and potassium in crystals of anhydrous sodium chloride, which, dependent on the temperature employed, communicates a variety of coloration to the salt. Whether the blue coloration frequently observed in rock-salt bears any relation to this observation, is not mentioned by the author.—Pharm. Ztg., li, No. 89 (1906), 987; from Ztschr. f. Elektrochem., 1906, No. 33.

Alkali Metals—Formation of Protoxides.—By applying the method by which he had previously obtained the protoxide of caesium (which see), E. Rengade has prepared the protoxides of rubidium, potassium and sodium, which had never before been obtained in a pure state. The author finds furthermore that the partial oxidation of the alkali metals, followed by distillation *in vacuo* of the excess of the metal, produces in a pure state the anhydrous protoxides, Cs_2O , Rb_2O , K_2O , and Na_2O : but these do not crystallize readily as in the case of caesium protoxide.—Chem. News, Jan. 11, 1907, 23; from Compt. rend., 143 (1906) No. 26.

Alkaline Protoxides—Properties.—E. Rengade finds that the alkaline protoxides obtained as above described, but with the substitution of glass vessels for those of silver used for the oxidation and distillation of the

alkali metal, present characteristic colorations. The oxides of rubidium, potassium, and sodium are less colored than that of caesium; that of rubidium is pale yellow when cold, and golden yellow when hot; that of potassium, white at the ordinary temperature, yellow at $200^{\circ}\text{C}.$; that of sodium slightly yellowish when heated. Determination of the densities of these protoxides, taken in well-dried toluene and referred to water at 0° , gave the following results: For sodium protoxide, $d\ 0^{\circ} = 2.25$; for potassium protoxide, 2.32; for rubidium protoxide, 3.72; for caesium protoxide, 4.78. The protoxides of caesium and rubidium, left standing at the ordinary temperature in the tube exhausted of air in which they were prepared, quickly changed in appearance; that of caesium gradually lost its beautiful red color and turned black; that of rubidium acquired a copper hue in parts. These color changes do not occur if the oxides are heated *in vacuo* in a tube containing no alkali metal; and observation has shown that caesium and rubidium possess a sensible vapor pressure at the ordinary temperature, and that these vapors are absorbed by the corresponding protoxides, though diffusion takes place only very slowly in the vacuum.—Chem. News, May 3, 1907, 214; from Compt. rend., 144 (1907), No. 14.

Caesium Protoxide—Preparation and Properties.—According to E. Rengade it is possible to prepare well-defined caesium protoxide in a perfectly pure crystalline condition by evaporating a solution of the oxide in an excess of caesium. It is thus obtained in the form of orange-red crystals, which react violently on water and decompose at about $500^{\circ}\text{C}.$ when in contact with silver and in the cold when in contact with liquefied ammonia. In the latter case, the protoxide is transformed into a mixture of amide and hydrate of caesium. The formula of the protoxide is found by estimating the caesium and measuring the oxygen used in the experiment (Cs_2O). The author is also preparing, by the same method, the oxides of rubidium and potassium.—Chem. News, Nov. 16, 1906, 241; from Compt. rend., 143 (1906), No. 17.

Hydrated Sodium Peroxide—Improved Method of Preparation.—Having some years ago pointed out the advantage of preparing sodium perborate by the action of boric acid on hydrated sodium peroxide instead of inversely, acting on borax with hydrogen dioxide, Dr. Bauer has given some attention to the preparation of the hydrated peroxide. According to the older methods, for instance de Forcrand's, the hydration of Na_2O_2 is effected by direct treatment with water at $0^{\circ}\text{C}.$; but this reaction is accompanied by an elevation of temperature (up to $40^{\circ}\text{C}.$) which results in the partial decomposition of the peroxide. Better results are obtained by the process of George Jaubert, patented in 1900, which consists in subjecting the Na_2O_2 to the action of water-vapor at the ordinary temperature, the loss of oxygen being prevented or reduced to a minimum. Having, however, observed that when hydrated sodium peroxide is dissolved

in water a considerable reduction of temperature results, Dr. Bauer conceived the idea of effecting the hydration of the peroxide by means of ice. He finds that on adding Na_2O_2 to about six times its weight of pounded ice or snow, stirring constantly, the mixture melts after the manner of ordinary freezing mixtures of sodium chloride and ice, with a reduction of the temperature to -8° or -9° C. There is no evolution of gas, and the greater part of the hydrate crystallizes out and is readily separated. The residual liquor may then be used for the preparation of further quantities of hydrate, which now requires only the use of 3 to 4 times its weight of ice for the safe conversion. Obtained in this way, hydrated sodium peroxide has the composition $\text{Na}_2\text{O}_2 + 8\text{H}_2\text{O}$, is relatively easily soluble in water with considerable reduction of temperature, possesses fair stability, and is non-hygroscopic, but is readily decomposed in the presence of carbon dioxide, which must be carefully excluded during the process of drying the salt in air.—Pharm. Ztg., li, No. 76 (1906), 840.

Hydrate of Sodium Dioxide—Color Reactions with Certain Organic Compounds.—Prof. E. Pinerva Alvarez finds that by means of the new general reagent of the polyphenols and their isomers, the hydrate of sodium dioxide ($\text{Na}_2\text{O}_2 \cdot 8\text{H}_2\text{O}$), prepared from sodium dioxide ($\text{Na}_2\text{O}_2 = 2\text{NaO}$), pure ethyl alcohol sp. gr. 0.767, and cold water, it becomes possible to identify the compounds mentioned below, by using a little porcelain capsule in which from 5 to 10 centigrms. of the body is placed, with 2 or 3 decigrms. of dioxide and 5 Cc. of alcohol, and, after allowing the bodies to react for four or six minutes, adding 15 Cc. of distilled water.

The colorations produced are the following :

Emodin.—Intense pink color, which becomes yellow with several drops of acetic acid.

Chrysarobin.—Wine color, which persists when water is added. With acetic acid it also becomes yellow.

Dioxyanthraquinone-1. 2.—Beautiful violet-blue color, which persists on adding water. On immersing the capsule in the liquid and blowing, the edges of contact become red. With acids, the liquid acquires an intense yellow color.

Alizarin.—Violet coloration, becoming orange with acids.

Trioxyanthraquinone-1. 2. 4.—Intense red-violet, changing to cherry-red on addition of water.

Chrysophanic Acid.—Cherry-red color, which with water becomes brighter.

Rosolic Acid.—Intense purple color, which persists with water.

Purpurine-alizarin.—Intense and very beautiful pink color, which persists on adding water.

Anthrogallol.—Dark blue color, almost black, unchanging.

Dioxyquinone.—Brown-yellow color, changing to red with water.

Ellagic Acid.—Brown-black color, becoming yellow with addition of water.—Pharm. Journ., Jan. 5, 1907, 6; from Chem. News.

Potassium—Phosphomolybdic Acid a Commercial and Reliable Reagent.

—A. Schlicht finds that if the precipitate of ammonium phosphomolybdate obtained in the well-known manner in the course of phosphoric acid determinations, is melted with soda and sodium nitrate in order to remove ammonia, and the fused mass is then dissolved in water and supersaturated with nitric acid, an admirable reagent for potassium salts is obtained. The reagent is added to the suspected liquid previously acidulated with nitric acid, and the mixture is heated to boiling. In the presence of even very small quantities of potassium a yellow precipitate separates on cooling. Neither calcium or magnesium compounds produce precipitates under these conditions, whilst other substances than potassium or ammonium, that are likely to produce this reaction, are so seldom present that they may be safely disregarded in practice.—*Pharm. Ztg.*, li (1907), No. 12, 117; from *Chem. Ztg.*, 1906, No. 104.

Potassium—A New Reagent.—Prof. Henry Leffmann directs attention to a new reagent for potassium which has recently been recommended by Alvarez. It consists of the sodium-naphthol-sulphonate commonly called

Eikonogen, and used as a photographic developer. It is recommended to be used in the form of 5 per cent. solution, which must be freshly prepared, since it spoils in a few hours, but does not appear to be a very sensitive reagent. It is sufficiently delicate, however to detect potassium in cold solutions of potassium chlorate and potassium acid tartrate.—*Proc. Penna. Pharm. Asso.*, 1906, 162.

Ammonium—Simple and Delicate Test.—Prof. Henry Leffmann recommends the following test for ammonia recently described by Trillat and Turchet and claimed by them to be more delicate than Nessler's, on the ground of simplicity and convenience: A few drops of 10 per cent. solution of potassium iodide are added to the neutral solution to be tested and then, drop by drop, with shaking, a solution of sodium hypochlorite. In the presence of even small amounts of ammonium compounds, a brownish precipitate—probably an iodamine—forms; small amounts of the reagents are necessary to avoid the liberation of free iodine.—*Proc. Penna. Pharm. Assoc.*, 1906, 162.

ALKALINE EARTHS.

Calcium—New Test for its Detection in Presence of Ba and Sr.—The difficulty of testing for calcium in the presence of barium and strontium has led F. F. Flanders to search for a test which would distinguish this metal from the two others. He found the action of potassium ferrocyanide on calcium compounds, referred to by Prescott and Johnson (1903), to give surprisingly good results, so good in fact that it seems almost impossible that the reaction has not been used before in this connection. In separating barium, strontium and calcium the commonly accepted method seems to be precipitation with ammonium carbonate in ammoniacal solu-

tion, solution of the washed precipitate in acetic acid, removal of barium by potassium chromate or dichromate, re-precipitation of strontium and calcium by ammonium carbonate in ammoniacal solution, re-solution of the precipitate in acetic or hydrochloric acid, removal of strontium by ammonium sulphate, and finally testing for calcium by addition of ammonium oxalate in ammoniacal solution. The weak point in this scheme is the danger of traces of barium and strontium remaining in solution, with the well-known effect on the calcium test. The suggested procedure is the same as the foregoing up to the point of the re-solution of the precipitate after barium has been removed (except that acetic acid only should be used). At this point the solution is divided, and calcium sulphate added to one portion to test for strontium. To the other portion an equal volume of ammonium chloride is added, and a few Cc. of potassium ferrocyanide. The presence of calcium is indicated by the formation of a light yellowish-green precipitate. The sensitiveness of the test has been tried on standard solutions of calcium salts, and when applied directly to the calcium solutions was found to indicate one part of calcium in 7,000 parts.—Chem. News, Oct. 19, 1906, 195; from Journ. Amer. Chem. Soc., 28, No. 10.

Lime.—Use and method of preservation of a standardized solution for the determination of the acidity of *urine*, which see under "Organic Chemistry."

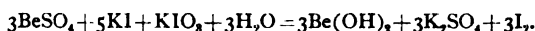
Magnesium Carbonate—Commercial Quality.—In the examination of six samples of magnesium carbonate, G. S. DuBois obtained the following data: Loss on ignition ranging from 38.45 per cent. to 45.2 per cent., the average being 41.77 per cent.; carbon dioxide ranging from 33.7 per cent. to 37.2 per cent., the average being 35.89 per cent. The sample giving the smallest percentage of residue and carbon dioxide was most nearly free from impurities, showing only a faint trace of iron.—Amer. Journ. Pharm., Sept., 1906, 416.

Dried Magnesium Sulphate—Proposed Modification of the G. P. Requirement.—A. Goldammer directs attention to the difficulty of securing a satisfactory product when the directions of the G. P. IV for preparing dried magnesium sulphate are followed. It is impracticable to reduce the weight of the crystalline salt on the water-bath to the prescribed amount (35 to 37 per cent. of loss), and the product is liable to absorb more or less water on exposure to air. The author regards this requirement too stringent and suggests that it be so modified that the *dried salt* shall, on heating to redness, not lose more than 20 per cent. of its weight, that it shall be a brilliant white powder, and that it shall form a clear and colorless solution with water.—Pharm. Centralh., xlviii (1907), No. 20, 395.

Beryllium—Separation from Aluminum and Quantitative Method of Determination.—B. Glassmann recommends a method for the separation

of beryllium and aluminum from each other, which is based upon the fact that when sodium thiosulphate is added to a solution of a beryllium salt and the liquid is boiled, it becomes turbid in consequence of the sulphur separated, but the beryllium remains in solution as sulphite or basic sulphite, while the aluminum is precipitated quantitatively as hydroxide. The solution of the oxides containing hydrochloric or sulphuric acid is first approximately neutralized with sodium carbonate, an excess of sodium thiosulphate is added, and the whole boiled till the smell of sulphurous acid has passed off. The liquid is then heated for half an hour on the water-bath. The aluminum oxide mixed with sulphur is washed and ignited. In the filtrate the excess of thiosulphate is decomposed with hydrochloric acid, and the beryllium is precipitated with ammonia, or, better, with an iodide-iodate mixture, as described in the following :

Quantitative Method of Determination.—In this iodine is liberated from a mixture of solutions of potassium iodide and iodate by beryllium salts, as shown in the following equation :



The reaction proceeds slowly in the cold, but when the mixture is warmed and the iodine is removed with thiosulphate it is complete in a few minutes, even in dilute solutions. The precipitate of beryllium hydroxide settles quickly, and allows of rapid filtration and washing. The solution in which the beryllium is to be determined must be neutral or very faintly acid ; if it contains excess of acids it must be neutralized with caustic soda till a precipitate begins to form, and this must then be dissolved in a few drops of dilute hydrochloric acid. Then an excess of a mixture of equal parts of 25 per cent. potassium iodide and saturated potassium iodate solution is added (containing about 7 per cent. of iodate). After five minutes the iodine separated is accurately decolorized with 20 per cent. sodium thiosulphate solution, and a little more of the iodide-iodate mixture is added in order to show that no more iodine can be separated. Then a small excess of thiosulphate is introduced, and the mixture heated on a water-bath. The precipitate is filtered off, washed with boiling water, dried, and ignited.—Chem. News, Nov. 23, 1906, 255 ; from Ber. d. D. Chem. Ges., xxxix (1906) No. 13.

EARTHS.

African Edible Earth—Composition.—W. Meigen has examined the "edible earth" which is used by the natives of German New Guinea for stomach and intestinal affections. It is a fat, ochre-yellow clay, having a camphor-like odor, and a not unpleasant aromatic taste, but contains at most only traces of oxidizable organic substances : Analysis gave 33.83 SiO₂, 34.03 Al₂O₃, 13.94 Fe₂O₃, 0.38 CaO, 0.23 MgO, 5.41 H₂O at 110° C.,

19.03 loss on incineration. The mineralogical composition may be calculated from these data to be as follows: 71.8 per cent. kaolin; 11.6 per cent. hydrargillit; 14.7 per cent. ferric oxide, and a rest of the silicates of calcium and magnesium.—Pharm. Ztg., li, No. 63 (1906), 702; from Monatsber. d. Dtsch. geol. Ges.

Edible Clays—Varieties Consumed in India.—David Hooper, referring to a paper which he and Dr. H. H. Mann had communicated to the Asiatic Society of Bengal, regarding the history and composition of the various forms of earth used for edible purposes in India states that in the thirty-three samples investigated, silicate was the largest ingredient, constituting over 80 per cent. in eight samples, 70 per cent. in twelve samples and over 60 per cent. in six samples. In a prepared earth called "gopichandana," from Baroda, was a marl with 61.35 per cent. of calcium carbonate; only in eight of the other samples did the lime exceed 1 per cent. A buff-colored shale called "multani-matti" was received from Baluchistan, Baroda and Bengal, where it is sold in the bazaars for edible purposes. Laterite is the edible clay of Mysore and Halloysite that of Travancore. and the Wynaad. Cimolite is baked and eaten in Bombay, and hydrated silica is used in Madras and Travancore. "Palia" stone of Rajputana, a stone eaten in times of scarcity, is talc-schist, and most of the remaining specimens were mixtures of sand and clay. The analyses showed that there is no food value in these earths, owing to the infinitesimal amounts of organic matter and soluble mineral salts.—Pharm. Journ., September 1, 1906, 259.

Aluminum Carbonate—Variable Composition and Properties.—According to A. Gawalowski, aluminum carbonate varies in composition according to its method of preparation; when prepared at atmospheric pressure it contains from 8 to 9 per cent. of carbon dioxide and 40 to 45 per cent. of alumina, whilst at a pressure of eight atmospheres a polycarbonate is obtained which dissolves in water, forming a clear solution; on reducing the pressure, carbon dioxide is evolved and the same carbonate as above is precipitated; the filtrate from this substance contains a soluble carbonate of aluminum, which on warming to 25° C. or 30° C. or on keeping for some time deposits a carbonate containing from 2 to 3 per cent. of carbon dioxide and about 50 per cent. of alumina. This substance and the carbonate, containing from 8 to 9 per cent. of carbon dioxide, are both white, tasteless substances; they are insoluble in cold acetic acid, but dissolve readily in hot acetic acid or in mineral acid.—Pharm. Post, 1906, 38, 756.

Salts of the Rare Earths—Toxicity on Ferments.—A. Hébert's experiments with the sulphates of cerium, lanthanum, thorium and zirconium on cultures of yeast and of *Aspergillus niger*, also with diastase and emulsin, show that although the two first named have no marked inhibitory influence, the zirconium and thorium salts are marked by toxic effects, their

sterilizing power being comparable to that of corrosive sublimate. It is suggested that if they should prove to have a similar action on pathogenic organisms they might prove useful additions to the list of medical disinfectants and germicides.—Pharm. Journ., Feb. 23, 1907, 227; from Compt. rend., 1906, 143, 690.

Cerium Salts—Color Reactions with Phenols.—N. A. Orlov calls attention to the observation that cerium salts, similarly to the salts of other heavy metals—such as iron, mercury, uranium, molybdenum, etc.—give with phenols certain color reactions which may serve for their identification. Thus, a solution of a quadrivalent cerium salt, for instance cerium sulphate, gives with ordinary phenol a red color, with phloroglucin a dark yellow, with pyrogallol an orange colored, with sulphosalicylic acid a red-brown, and with sodium salicylate an olive-brown precipitate. A violet colored precipitate is produced by cerium salts with tannin; but when the sulphate is used, this color is rapidly discharged, while a much more permanent precipitate is obtained with cerium acetate, or by a mixture of cerium sulphate with ammonium acetate in excess. The author suggests furthermore that the reaction with phenols may also serve for the detection and identification of traces of ceric oxide. Sulphosalicylic acid, for instance, gives a distinct dark-yellow color in solutions of 1:2000 ceric oxide.—Pharm. Ztg., lii (1907), No. 31, 324; from Pharm. Journ. I. Russl., 1907, 95.

ZINC.

Zinc—A Sensitive Reaction for Its Quantitative Determination.—G. Bertrand and M. Javillier describe a very sensitive method for the quantitative determination of zinc, which is based upon the observation that if ammonia is added in excess to a solution of a zinc salt containing an abundance of a calcium compound, and the solution—clarified if necessary by filtration—is heated to boiling, a micro-crystalline precipitate of calcium zincate will be gradually deposited. The reaction is available for determining as small quantities as, for example, 0.001 Gm. zinc in 500 Cc. of water, and with these quantities is carried out as follows: A few Cc. of milk of lime (or 50 Cc. of lime water) are added to the suspected liquid, followed by ammonia in excess; the liquid is filtered, heated to boiling until ammonia vapor is copiously evolved, and allowed to cool. The precipitate calcium zincate is collected, dissolved in hydrochloric acid, the solution evaporated to dryness, the residue dissolved in water, the concentrated solution treated with ammonia, and the calcium precipitated with oxalic acid. The filtrate retains the zinc, which is converted into sulphate, calcined and weighed.—Pharm. Ztg., lii (1907), No. 12, 117; from Bull. des sc. pharmacolog., 1906, No. 12.

Zinc Chloride—Simple Method to Effect a Clear Solution.—Franz Wipperrn directs attention to the fact that while pure zinc chloride usually

produces a turbid solution when it is dissolved in cold water, it dissolves perfectly clear in hot water and the solution remains clear on cooling.—Pharm. Ztg., li, No. 73 (1906) 807.

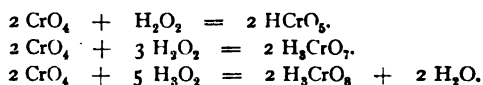
CHROMIUM.

Chromium—Definite Compounds with Boron.—Binet du Jassonneix has found that the reduction of chromium oxide by boron in the electric furnace in crucibles of magnesium yields fusions containing from 5 to 17 per cent. of boron combined with chromium; a systematic study of their properties has been made in order to classify and isolate the definite compounds which they might contain. Specimens containing percentages of boron varying from 4.9 to 11.6 were examined; microscopic examination showed that these bodies consisted of two different substances, one acting as a kind of cement to the other, which increased in proportion to the percentage of boron; the specimen with 11.6 per cent. boron is almost homogeneous. The results after several analyses, on the lines indicated in a previous note, show that the fused products of chromium and boron contain two definite compounds, Cr_3B_2 and CrB , dissolved respectively in a medium rich in boron.—Chem. News., Jan. 11, 1907, 23; from *Compt. rend.*, 143 (1906) No. 26.

Chromium Boride—Preparation and Properties.—E. Wedekind and K. Fetzer have succeeded in preparing a chromium boride by a method in which they have overcome the difficulty of producing a compound of definite composition, which is encountered when the usual method of heating a mixture of chromium oxide and boron in the electric furnace is followed. They allowed the liquefied metal formed from chromium thermite to act on the calculated amount of boron. The latter was prepared by Moissan's method from boric acid anhydride and magnesium. Before the beginning of the experiment the chromium thermite was converted into a pulp with liquid air. Then amorphous boron was placed at the bottom of a Hessian crucible, covered with chromium thermite, and then with the above thick liquid. Then a mixture of barium peroxide and aluminum was mixed with this upper layer. The reaction was violent, and, after cooling, the regulus was broken up in a steel mortar and treated with warm dilute hydrochloric acid to remove the excess of uncombined chromium, then with nitric acid, and finally with aqua regia. After washing with water and drying, a silver-white crystalline powder was obtained. Chromium boride is characterized by its extraordinary resistance to acid and alkaline reagents. Even hydrofluoric acid and mixtures of hydrofluoric and nitric acid have no effect upon it, and the authors found that sodium peroxide is the only substance which would decompose it into its constituents. While the chromium boride obtained was not quite pure, but contained some uncombined metal, there could be no doubt from the analysis, made and described by the authors, that it has the simple formula CrB , correspond-

ing to the formulas of the other borides—FeB, CoB, NiB, and MnB—heretofore obtained and described. Its specific gravity is 5.4 at 17° C. It conducts an electric current, and is very hard, scratching glass and quartz easily. It is fusible only with difficulty, and can be heated to a red heat in a current of oxygen for some time without undergoing any alteration. Hydrochloric acid gas acts upon it only very slowly. It possesses ferromagnetic properties, and is attracted by a powerful electro-magnet.—Chem. News, March 1, 1907, 107; From Ber. d. D. Chem. Ges. xl (1907) No. 1.

Perchromic Acid—Formation by Means of H₂O₂.—H. Riesenfeld divides the perchromic acids which have in recent years been described into four classes, viz., CrO₄, H₂CrO₆, H₂CrO₇, and H₂CrO₈, and finds that all of these acids may be produced by the oxidation of the solutions of a chromate with 3 per cent. solution of hydrogen dioxide. Regarding the perchromic acid, CrO₄, as the elementary radical of these acids, this by the assimilation of H₂O₂, is converted into the higher oxides according to the following equations:



The well-known blue ethereal solution of perchromic acid he regards as being a mixture of these acids, for which, and not for a distinct compound, the designation "perchromic acid" should be retained. The red

Ammonium Perchromate, of the formula (NH₄)₂CrO₈, is obtained by cooling a mixture of 75 Cc. water, 50 Cc. of 25 per cent. ammonia water and 25 Cc. of 50 per cent. chromic acid until ice begins to form, and adding, drop by drop, 25 Cc. of 30 per cent H₂O₂. The octahedral-like crystals which separate after standing two hours are washed with alcohol to remove excess of chromic acid and, after rinsing them with ether, are dried on a clay plate. The author also describes the methods for obtaining the ammonium salts of the other perchromic acids.—Pharm. Ztg., li, No. 62 (1906), 687; from Ber. d. D. Chem. Ges., 38, 3380.

MANGANESE.

Manganese—Ferromagnetic Compounds.—E. Wedekind has previously shown that manganese boride is ferromagnetic, and he finds that the antimonide, MnSb, possesses the same property. Hence he considers that possibly definite chemical compounds of manganese with other elements are the carriers of the ferromagnetism, and the same components may yield magnetic and non-magnetic compounds, which differ chemically in stoichiometric composition. This hypothesis is supported by the fact that some compounds, for example, manganese phosphide, have been described by different investigators as magnetic and also as non-magnetic. When

antimony acts on liquid manganese, only one stable compound, MnSb , can be isolated. This is more magnetic than manganese boride, MnB . Both borides, MnB and MnB_2 , are ferromagnetic, but it is very difficult to separate MnB completely from MnB_2 , and probably MnB_2 is non-magnetic, while the carrier of the magnetism is the compound MnB . The crystalline phosphide, Mn_3P_2 , is distinctly magnetic, as is also Mn_3P_2 . No phosphide, MnP , could be prepared. The investigation of the question of the degree of permeability of the ferromagnetic compounds of manganese compared with those of iron presents great difficulties, but the author found that powdered manganese boride, MnB , is more than half as strongly magnetic as powdered iron, whereas compact MnB is about a quarter as strongly magnetic as soft iron. The compact antimonide is nearly twice as strongly magnetic as MnB .—Chem. News, May 10, 1907, 227; from Ber. d. D. Chem. Ges., xl (1907), No. 6.

IRON.

Soluble Sulphide of Iron—Formation.—Konschegg and Malfatti find that when basic compounds of iron, such as the hydroxide, or the mixture of basic acetate and phosphate of iron obtained when precipitating a phosphate from solution, are treated with ammonium sulphide, none of the black sulphide of iron is produced, but a clear, deep green solution, with a feeble alkaline reaction, is obtained. A similar behavior is shown by the iron sulphide formed by adding ammonium sulphide to a solution of ferric chloride. If, after washing away the ammonium salts from the precipitate initially formed, it is treated with water and a small amount of sodium or potassium hydroxide, it dissolves on standing, or immediately on warming, to form a deep green solution, whereas ferrous sulphide is not soluble under these conditions. The authors conclude from these experiments, which they regard as only preliminary, that this soluble sulphide is not a colloidal form, as Dr. Koninck supposes, but that alkali is a necessary component of the soluble iron sulphide, which must be regarded as the alkali salt of a "sulpho-iron" acid.—Pharm. Journ., Jan. 12, 1907, 28; from Ztsch. Anal. Chem., 1906, 45, 747.

Colloidal Ferric Hydroxide—Preparation and Properties.—H. Schwei-kert proposes a preparation of colloidal ferric hydroxide as a comparatively cheap and very efficient means of purifying water. Added in the proportion of 1 liter to a cubic meter of water a precipitate is produced containing all the iron, carrying down all suspended matter, diminishing the quantity of dissolved substances, and reducing the number of bacteria to at least one-fifth of those in the original water. It is practically identical with the Liquor Ferri Oxidati Dialysati of the Germ. Apoth. Ver., and may readily be prepared as follows: Add sodium carbonate or bicarbonate in small quantities at a time to a moderately dilute solution of ferric chloride, taking care that the precipitate is redissolved before a fresh ad-

dition is made, until the liquid diluted with water fails to react or gives only the faintest red coloration with sulphocyanide. Both the ferric chloride and sodium salt must be free from sulphate. Sufficient sodium carbonate is now added to precipitate the whole of the iron, and yielding a colorless, faintly acid, or neutral, but not alkaline filtrate. The precipitate is collected, washed with small quantities of water until the filtrate acquires a yellow color or shows only a slight reaction for chlorides. It is then well drained and dissolved in water. If the mother liquor from the ferric hydroxide was slightly acid the solution will be clear, but if it was neutral the solution will be turbid: in the latter case it can be made clear by adding just sufficient ferric chloride solution to effect this on gently warming. The result is a clear, dark reddish-brown liquid. It should have a specific gravity of 1.050 to 1.051 and contains 3.5 per cent. of iron.—Arch. d. Pharm., 245 (1907) No. 1., 12-25.

Pure Ferrous Carbonate—Preparation by a Patented Process.—See *Blaudium*, under "New Remedies."

LEAD.

Minium—Adulteration with Colored Barytes.—Frehse observes that minium, while often adulterated with ochre, is most frequently adulterated with barytes colored with Orange II. These adulterants may be detected by treating the minium with nitric acid and some organic reducing agent, such as sugar or formol, when, if pure, the minium will dissolve completely. If colored with Orange II, this is detected by communicating its color to alcohol when shaken with it.—Pharm. Ztg., li, No. 61 (1906), 680; from Ann. Chim. anal. appl., 11, 176.

COPPER.

Copper—Microchemical Determination.—According to Meerburg and Filippi copper produces with caesium chloride a handsome red double salt in form of crystalline needles or prisms, which are easily recognized under a lens even when produced in solution containing only 0.001 Mgm. of copper. The addition of a large quantity of caesium chloride produces yellow crystals, which become red on addition of a little cuprous chloride. The presence of cobalt or iron interferes with the distinctness of the reaction, but that of lead or bismuth exerts no influence upon it.—Pharm. Ztg., li, No. 62 (1906), 688; from Rép. de Pharm., 1906, No. 6.

Colloidal Copper—Red and Blue Modifications.—C. Paal and W. Leuze describe two modifications of colloidal copper, the one red and stable, the other blue and possessing less stability. Both are obtained under slight modifications of the process by subjecting pure colloidal cupric oxide to the action of hydrazin hydrate in quantities slightly in excess of that necessary for its reduction. From concentrated solutions of cupric oxide the blue modification is generally obtained whilst dilute solutions

yield the red form, particularly in the presence of ammonia. Both modifications may be obtained in solution, which, in the case of the red form may be kept unchanged for years if it is protected from oxidation, and both may be obtained in a solid form.

Colloidal Cupric Oxide is produced according to the authors by methods similar to that by which colloidal silver and mercury are obtained, viz., solution of the precipitates with the aid of sodium lysalbinat or protalbinat in caustic alkalies. The deep blue colloidal fluids obtained, after purification by dialysis, yield solid colloidal cupric oxides on evaporation in a partial vacuum, which differ in some unimportant respects, depending on the material (lysalbinat or protalbinat) and the proportion used in their preparation.—Pharm. Ztg., li, No. 62 (1906), 688; from Ber. d. D. Chem. Ges., 39, 1545-1550.

THORIUM.

Radiothorium—Question of Priority of Discovery.—V. Rössler reminds that radiothorium was not, as is claimed, first discovered in England, by Sir Wm. Ramsay, but in Germany, by J. Elster and H. Geitel, who, in connection with a study of the radio-activity of earths and spring-muds, published in *Physikalische Zeitschrift*, Vol. 5 (1904), No. 12, subjected also the mud from the fountain-head of the springs of Baden-Baden to study and investigation. This mud showed a potential decline of 3000, and was, therefore, next to uranium pitchblende, the most radio-active crude substance discovered up to that time. They furthermore observed that the decline of radio-activity, while on the one hand essentially slower than that determined for radium, was on the other more rapid than that of thorium, and on this observation the authors assumed at that time the presence of a radio-active element in the thermal mud of the Baden-Baden spring. It was not until a year later that Hahn and Ramsay published their researches on the radiothorium isolated from Ceylon thorianite.—Pharm. Ztg., li, No. 89 (1906), 986; from Pharm. Traxis, 1906, No. 9.

MERCURY.

Mercury—Aluminum Gauze as a Protection from its Vapor.—Tarugi states that to protect workmen employed in handling mercury from the fumes of the metal, a mask and respirator of fine mesh aluminum gauze has been devised. In contact with mercurial vapor this oxidizes very quickly, and at the same time fixes the mercury.—Pharm. Journ., Jan. 19, 1907, 59; from Bull. gén. de Thérapeut., 1906, 152, 642.

Mercury—Woolfat as an Extinguishing Agent.—See *Mercurial Ointment* under "Pharmacy."

Mercuric Oxides—Distinctions of the Yellow and Red Variety.—In reply to the inquiry why the two forms yellow and red mercuric oxide are recognized by the Pharmacopœia, the editor of "Drugs and Sundries"

states the two forms do not differ merely in their state of aggregation but that there is a chemical difference between them which does not admit of the substitution of the one for the other. As is well known, the yellow variety was introduced into pharmacy by oculists, who had found that eye ointments prepared with the old style of "red precipitate" acted as mechanical irritants, on account of the fact that the crystalline scales of this form of oxide were never sufficiently reduced in size by trituration, and that the resulting ointment was invariably specky." The specks left by an ultra-conscientious pharmacist might be invisible to the eye, but although unseen, they would be felt. If any one doubts the propriety of introducing the yellow variety, which is naturally amorphous, a few hours' exercise in trying to match the color of a good sample of the yellow by scrubbing a sample of the red scaly form in a mortar will reduce the doubt to a nonentity.—Bull. Pharm., Nov. 1906, 479.

Yellow Oxide of Mercury, B. P.—Limit of Fixed Impurity.—J. Reddall Smith says that while the B. P. requires yellow oxide of mercury to yield 92 to 92.5 per cent. of mercury, it fails to require a maximum limit of fixed impurity, as is done, for instance, in the U. S. P., which allows a maximum of 0.1 per cent. of fixed mineral matter as residue on ignition. This he considers quite reasonable and should be adopted in the next B. P. Out of ten samples recently examined, only one sample gave less than 0.5 per cent. of ash—the others ranging from 0.83 to 1.66 per cent. As the theoretical amount of Hg for pure HgO is 92.6 per cent., it follows that a sample which shows more than 0.6 per cent. of fixed mineral matter cannot contain the correct amount of mercury.—Pharm. Journ., Feb. 9, 1907, 129.

Mercuric Peroxide (HgO_2)—A New Compound.—Bredig and v. Antropow have succeeded in preparing a new mercuric oxide, having the formula HgO_2 , by the action of H_2O_2 on mercury. From red mercuric oxide (HgO), prepared by the dry method, and a 30 per cent. hydrogen dioxide, a deep red-brown body was obtained, from which H_2O_2 was split off on washing it with water. By drying the new oxide rapidly it remains intact for some time, but on rapidly heating it explodes very violently. It appears to be the mercury salt of the feeble hydrogen peroxide acid, corresponding to BaO_2 .—Pharm. Ztg., li, No. 89 (1906), 987; from Chem. C. Bl., 1906, ii, No. 13.

Hydrargyrum Precipitatum Album, G. P.—Chemical Nature.—In view of the conflicting views regarding the chemical nature of the non-fusible white precipitate of the G. P., Dr. Ernst Schmidt has inaugurated experiments in the laboratory of the Pharmaceutical and Chemical Institute of the University of Marburg, which have been carried out by L. Krauss. The results of these investigations lead to the conclusion that the official (G. P.) white precipitate is a mixture of much di-mercury-ammonium

chloride-chlorammonium ($\text{NH}_2\text{HgCl} + \text{NH}_4\text{Cl}$) with a little mercury-ammonium chloride (NH_2HgCl).—Pharm. Ztg., li, No. 77 (1906), 849.

Ammoniated Mercury, B. P.—Looseness of Definition.—Thomas Tyrer, calling attention to the looseness or want of definition in some cases in the B. P., mentions as an example that the formula HgCl.NH_3 given for ammoniated mercury is evidently that on which the percentage of mercury is calculated, and is not founded on experimental work. The B. P. gives 78 to 79 per cent. as the yield on "being heated with excess of lime," a method which has proven unreliable in the hands of several expert analysts. On the other hand, the estimation by hypophosphorous acid was found reliable, and could well be adopted as official. This shows that commercial and reliable samples may legitimately vary between 75.50 and 77.32 per cent. The reason for this variation is in all probability due to the presence of ammonium chloride, which is found in all commercial samples of ammoniated mercury. This leads the author to direct particular attention to the official requirement that the washing of the precipitate with cold distilled water be continued "until the liquid which passes through is free from chloride." In this the compiler not only ignores commercial conditions, which demand a white salt, but there is also no regard for the instability of ammoniated mercury, and that it undergoes decomposition by prolonged washing, and, as demonstrated experimentally by the author, becomes yellow long before the chlorine is completely removed.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1906, 302-304.

Hydrargyrum Precipitatum Album, G. P.—Precautions when Applying the Acetic Acid Solubility Test.—Dr. Hugo Bauer calls attention to the necessity of employing diluted acetic acid of assured purity when applying the acetic acid solubility test of the G. P. to white precipitate. This depends upon the insolubility of any calomel that may be present when the white precipitate is warmed with diluted acetic acid. The author found that a specimen of white precipitate prepared according to the formula of the G. P., as well as a sample purchased from a reliable dealer, failed to dissolve completely in commercial diluted acetic acid (sp. gr. 1.040), nor in ordinary glacial acetic acid—the latter producing in the same samples a much denser precipitate of calomel. On rectifying these acids by distillation with chromic acid, however, both samples were dissolved perfectly by either of the acids under the conditions of the test. The author's further experiments appear to indicate that the impurity responsible for the reduction of the mercuric salt to calomel is formic acid; but this requires further confirmation, since the reduction, which results when a diluted acid of sp. gr. 1.040 is used, does not result when identically the same acid has a concentration corresponding to the sp. gr. 1.060.—Pharm. Ztg., li, No. 84 (1906), 931.

Mercuric Iodide—Compounds with Monomethylamine.—M. François

has obtained and describes compounds of mercuric iodide with one, two and five mol. of methylamine. If a rapid current of pure, dry methylamine is passed over pure, dry mercuric iodide, a turbid liquid is formed, which when completely saturated with methylamine, contains the compound $\text{HgI}_2 \cdot 5\text{CH}_3\text{NH}_2$. On standing in a partially open vessel, colorless crystals of the compound $\text{HI}_2 \cdot 2\text{CH}_3\text{NH}_2$ separate from the liquid, and if these very pure crystals are exposed to a current of air at the ordinary temperature they will lose another mol. of methylamine, with formation of the compound $\text{HI}_2 \cdot \text{CH}_3\text{NH}_2$. The latter compound may also be produced if the finely pulverized crystals of the compound $\text{HI}_2 \cdot 2\text{CH}_3\text{NH}_2$ are placed in a small capsule over a thick layer of HgI_2 contained in a larger, air-tight vessel, until the weight of the powder becomes constant. In this way the compound $\text{HgI}_2 \cdot \text{CH}_3\text{NH}_2$ is obtained in the form of a yellowish-white powder, which on exposure to air is only slowly converted into red HgI_2 . The compound $\text{HgI}_2 \cdot 5\text{CH}_3\text{NH}_2$ is obtained pure by treating the pure crystals of $\text{HgI}_2 \cdot 2\text{CH}_3\text{NH}_2$ with methylamine to saturation. It forms a colorless liquid, which congeals at -46°C . to a crystalline mass, but on exposure to air is again converted into the solid compound $\text{HgI}_2 \cdot 2\text{CH}_3\text{NH}_2$. The compound $\text{HgI}_2 \cdot \text{CH}_3\text{NH}_2$ may be obtained in the crystalline form by adding a solution of methylamine to an excess of a saturated solution of HgI_2 in KI .—Pharm. Ztg., li, No. 62 (1906), 687; from Compt. rend., 142, 1199.

ARSENIC.

Arsenic—New Methods of Preparing Some Organic Derivatives.—V. Auger describes a number of new methods for the preparation of certain arsenic derivatives.

Methylarsine Iodide, CH_3AsI_2 , is obtained by adding 150 Gm. of hydrochloric acid to a mixture of 200 Gm. sodium methylarsinate, 250 Gm. potassium iodide and 500 Gm. water, saturating the mixture in the cold with sulphurous acid, precipitating the methylarsine iodide completely with 150 Gm. more of HCl , collecting the precipitate, and washing it with dilute HCl .

Methylarsine Oxide, CH_3AsO , is obtained by heating a benzol solution of methylarsine iodide with dry soda (NaOH ? Rep.) under a reflux condenser until the solution is completely decolorized. The yield is theoretical.

Methylarsine Chloride, CH_3AsCl_2 , is obtained by carefully adding methylarsenic acid to an excess of well-cooled phosphorus trichloride (PCl_3), and fractionating the product of the reaction. The product is, however, contaminated with small quantities of AsCl_3 resulting from a side-reaction.

Cacodyl Chloride, $(\text{CH}_3)_2\text{AsCl}$, is obtained by adding a calculated quantity of sodium hypophosphite, dissolved in excess of HCl , to a solution of cacodylic acid in hydrochloric acid, and subjecting the mixture to distillation; or, by gradually adding cacodylic acid to well-cooled phosphorus

trichloride, decomposition of the POCl_3 formed, by means of cold concentrated HCl , and fractionating the mixture.

Cacodyl Oxide, $(\text{CH}_3)_2\text{As}(\text{O})\text{As}(\text{CH}_3)_2$, is readily produced by the action of dry sodium carbonate on cacodyl chloride.

Cacodyl, $(\text{CH}_3)_2\text{As}(\text{O})\text{As}(\text{CH}_3)_2$, is obtained by the action of sodium hypophosphite, in excess, dissolved in HCl , on cacodylic acid.

Tetra-Methylarsonium Iodide, $(\text{CH}_3)_4\text{AsI}$, is obtained by boiling (for about one day) under a reflux condenser, a concentrated aqueous solution of cacodylic acid and an excess of sodium hypophosphite with methyl-iodide and one-fourth ($\frac{1}{4}$) the theoretical quantity of HCl , in a current of CO_2 , until the methyl iodide is completely consumed; then precipitating the iodide formed by an excess of solution of NaOH and recrystallizing the product from boiling alcohol which has been previously saturated with CO_2 for the purpose of precipitating the alkali dissolved by it.—Pharm. Ztg., li, No. 62 (1906), 687; from Compt. rend., 142, 1151.

Arsenic—Electrolytic Method of Determination in Urine.—According to C. E. Carlson arsenic may very conveniently be determined in urine and other organic secretions by an electrolytic method, which is carried out by means of a U-tube into which potassium electrodes have been fused. In the presence of arsenic, this is evolved as hydrogen arsenide at the cathode and is recognized by laying a piece of silver nitrate paper on the orifice of the cathode-limb of the U-tube. With an electromotive force of 7–8 volts it was quite possible to obtain a distinct reaction on exposing 30 Cc. of urine containing $\frac{1}{1000}$ Mgm. As. to electrolysis for one hour. Prolonged continuance (3–4 hours) of the reaction must, however, be avoided, because of the liability of the silver nitrate paper to become browned by the hydrogen sulphide generated during the reaction. Under certain modifications of the process, also, the hydrogen arsenide may be conducted through a reduction tube, as in Marsh's test, and a mirror obtained in the presence of the smallest traces of arsenic.—Pharm. Ztg., lii, No. 13, (1907), 127; from Ztschr. f. physiol. Chem., through Chem. C.-Bl., i, No. 3, 1907.

Arsenic—Method for Evolving Hydrogen in Marsh's Test.—Georg Lockemann, in opposition to Gautier and to Vamossy, who favor the use of platonic chloride for activating pure zinc in Marsh's test for arsenic, recommends treating the zinc with copper sulphate solution and subsequent washing. Using zinc which is thus covered with copper, the author was able to obtain an arsenic mirror from only 0.0001 Mg., whereas platinized zinc required ten times the quantity of arsenic. There is no danger of the copper sulphate retaining any arsenic as stated by Gautier.—Pharm. Journ., Sept. 22, 1906, 325; from Zschr. f. angew. Chem., 1906, 19, 1362.

Arsenic.—Precaution when testing for its presence in *Bismuth Preparations*, which see.

Arsenic Acid—Iodometric Method of Determination.—Rosenthaler finds that by reversing the well-known iodometric method employed for the quantitative estimation of arsenous acid (arsenic trioxide) a very useful method for the estimation of arsenic acid, the reaction between the latter and potassium iodide in the presence of hydrochloric acid taking place in accordance with the following equation: $2\text{H}_3\text{AsO}_4 + 4\text{KI} + 4\text{HCl} = \text{As}_2\text{O}_3 + 4\text{I} + 4\text{KCl} + 5\text{H}_2\text{O}$. In the presence of a large excess of HCl the reaction may be completed without heating, within 10 to 15 minutes, the liberated iodine being then titrated with $\frac{N}{10}$ thiosulphate V. S. The method is carried out by dissolving the potassium salt of arsenic acid in a little water, adding 2 Gm. of potassium iodide, followed by hydrochloric acid (25 per cent.) until a precipitate just forms, and then enough water to just redissolve it. After 10 to 15 minutes the solution may then be titrated (with or without an indicator or the use of petroleum ether) with $\frac{N}{10}$ thiosulphate.—Pharm. Ztg., li, No. 98 (1906), 1083; from Ztsch. f. anal. Chem., 45 (1906), Nos. 9 and 10.

Bismuth Preparations—Precaution when Testing for Arsenic.—B. P. Caldwell calls attention to an apparent reaction for arsenic when testing a preparation of bismuth which had previously been proven to be free from arsenic, as had also the reagents employed. Having shown the absence of arsenic in the preparation by using his own apparatus and reagents, he repeated the operation in the apparatus of the pharmacist who had obtained the reaction for arsenic, and was surprised to obtain an apparent reaction for arsenic with the material and reagents previously used in his apparatus with negative results. He found, however, on further investigation that the black stain produced on porcelain was not arsenic, as supposed, but was due to bismuth, which was carried over in the pharmacist's apparatus because nothing had been interposed between the generator and outlet to arrest it. In view of this observation, which so far as known to the author has not heretofore been recorded, the author wishes to impress the importance of interposing something—if only a cotton wad—to arrest the particles from the generator, in testing for arsenic in bismuth preparations.—Amer. Jour. Pharm., May, 1907, 201-203.

Bismuth Carbonate—Test for Nitrates.—F. H. Alcock suggests the following test for the presence of nitrates liable to be present in commercial samples of bismuth carbonate: One Gm. of the salt, previously triturated in a glass mortar to break down aggregated particles, is placed in a small stoppered bottle and shaken well with 5 Cc. of 10 per cent. ammonia water, allowed to stand for some time with occasional agitation, and filtered through a small Swedish filter, washing the latter after well draining, if necessary. The filtrate and washings are acidified with a few drops of

sulphuric acid, cooled, a solution of ferrous sulphate (40 Gm. per 100 Cc.) added and well mixed. Strong sulphuric acid is then poured down the side of the test-tube into the mixture, noting the intensity of the ring formed and, after shaking, the depth of the brown color of the liquid and the amount of gas when viewed down or across the tube. Commercial samples so examined were found to vary very considerably. The B. P. test, depending on the decoloration of indigo solution, is not so reliable. —Pharm. Journ., Sept. 22, 1906, 319.

TANTALUM.

Tantalum—Redetermination of Atomic Weight.—F. Willy Hinrichsen and N. Sahlbom criticise the method by which Marignac determined the atomic weight of tantalum. This consisted in purifying potassium tantalum fluoride (K_2TaF_7) by partial crystallization, treating it with concentrated sulphuric acid, extracting the potassium sulphate thus formed with hot water, and igniting the residue, which consisted of a mixture of tantalum sulphate and tantalic acid. The Ta_2O_5 thus obtained was then weighed, and the potassium sulphate in the filtrate was also determined. The atomic weight was thence calculated to be 183. This method, however, is open to objection; for instance, fluorine is not included amongst those elements whose atomic weights are accurately known, and, moreover, it is very probable that on evaporation with sulphuric acid some of the tantalum passes away as fluoride. The authors have consequently undertaken a new determination. First of all they used potassium tantalum fluoride, but were not satisfied with the results, so fell back upon the conversion of the metal into oxide. Perfectly pure metal foil was cut up into small pieces and ignited in a platinum Rose's crucible in pure oxygen. As the mean of five experiments which agreed well among themselves it was found that $Ta = 181.0$. According to Bernouilli, an anode of tantalum metal is dissolved in strong alkali solution when an electric current is passed. The authors accordingly tried, by using a suitable silver salt solution in the circuit and comparing the weight of the tantalum dissolved with the weight of the silver separated, to find the equivalent of tantalum. The experiments, however, failed, because at low potentials the tantalum electrode was not attacked, and when the potential was raised, solution took place suddenly and large sparks were formed.—Chem. News, Nov. 16, 1906, 241; from Ber. d. D. Chem. Ges., xxxix, No. 12 (1906).

SILVER.

Silver—Atomic Weight.—Th. A. Guye and G. T. Gazarian have made a series of researches on the atomic weight of silver, as there has hitherto been some discrepancy in the numbers obtained. Their experiments are chiefly directed towards the determination of the causes of error in the former investigations. They find that the chief error lies in the fact that

the chlorate of potash always contains traces of chloride, and the presence of one ten-thousandth of chloride in the KClO_3 raises the atomic weight of silver by 0.0177. The mean of the two best applications of the method of the halogenates, corrected and completed as the authors describe, is the number 107.893, or, in round numbers, 107.89. The mean value of ten analyses, all of different silver salts, give as a mean 107.890, and the results are so remarkably concordant that the authors assert that the atomic weight of silver should be lowered from 107.93 to 107.89. This alteration would entail a corresponding correction in a large number of other atomic weights.—Chem. News, Oct. 12, 1906, 183; from Compt. rend., 143 (1906), No. 11.

Trade Named Silver Compounds—Comparative Bactericidal Action and Percentage of Silver.—C. R. Marshall and E. F. Macleod Neave have determined the silver content of the various silver compounds recommended and in common use as bactericidal agents, and have made a comparison of their bactericidal activity with solutions each containing identical percentages of silver on the basis of the percentages determined by the assay of the sample. These percentages of silver found were as follows:

	Ag. per cent.
Collargol	86.6
Silver fluoride.....	81.7
Silver nitrate.....	63.6
Itrol	60.8
Actol	51.5
Argentol	31.2
Ichthargan	27.1
Argyrol	20.0
Albargin	13.4
Nargol	5.6
Iargin	9.4
Novargan	7.9
Protargol	7.4
Argentamine	6.4
Argenin	3.8

With the exception of nargol, argyrol and collargol, the bactericidal action of all the silver compounds mentioned, in solutions containing the same percentage of combined silver, is found to be closely similar, and it is impossible to place them in any order of activity which would be true under all circumstances. *Nargol* was found to be much less powerfully bactericidal, while *argyrol* and *protargol* possess practically no bactericidal power whatever, and since *argyrol* and *collargol* are not bactericidal, it is evident that the amount of silver which a compound may contain is no criterion of its bactericidal power. Moreover, in view of the results obtained with *argyrol* it seems impossible to attribute the good effects which many clinicians have obtained with it to its bactericidal action.—Pharm.

Journ., Aug. 25, 1906, 237; from Rep. of Therap. Com. of Br. Med. Assoc., B. M. J., Aug. 18, 1906.

Silver Chloride—Solubility in Solution of Silver Nitrate.—Max Lefeldt calls attention to the moderate solubility of silver chloride in concentrated solutions of silver nitrate, and the consequent necessity to secure the complete reduction of the chloride when silver nitrate is to be prepared from silver residues. If this reduction is to be effected by means of glucose in the presence of sodium carbonate, as is customary, the precaution must be observed to maintain a considerable excess of soda throughout the process. The reduction by means of metallic zinc, although very convenient, is not well adapted because of the difficulty to remove the last traces of zinc. The author recommends as the most satisfactory method to melt the silver chloride with an equal quantity of a mixture of 2 parts of anhydrous sodium carbonate, 2 parts of potassium carbonate and 1 part of potassium nitrate in a Hessian crucible, and conducting the fusion preferably in a wind-furnace. A regulus of pure silver is thus obtained from which the slag is readily removed.—Apoth. Ztg., xxi, No. 61 (1906), 643.

GOLD.

Gold—Thiocarbamide a Solvent.—J. Moir has found that gold leaf is readily soluble in an acid solution of the ordinary thiocarbamide, solution being facilitated by the addition of some oxidizing agent, such as ferric chloride, potassium dichromate, or hydrogen dioxide. The compound produced was isolated in the form of colorless six-sided rhombic crystals, and is identical with the compound produced by boiling NaAuCl_4 with solution of thiocarbamide, but differs from the well-known compound $\text{AuCl}_2\text{CH}_4\text{N}_2\text{S}$ obtained from gold chloride and thiocarbamide.—Pharm. Ztg., li, No. 62 (1906), 688; from Proc. Chem. Soc., 22, 105.

Chlor-Auric Acid—Correction of Formula.—R. Weber, who first subjected chlor-auric acid to comprehensive study (1867), attributed to the crystallized acid the formula $\text{AuCl}_3 + \text{HCl} + 3\text{H}_2\text{O}$, which was subsequently modified by J. Thomsen (1877) to $\text{AuCl}_3 + \text{HCl} + 4\text{H}_2\text{O}$ and is now so generally accepted in most of the text books. So also in the "Lehrbuch der pharmaceutischen Chemie" of Prof. Ernst Schmidt. Recent investigations by the latter, however, lead him to question the correctness of Thomsen's formula for the air-dry substance. When dried to constant weight over lime in an exsiccator, and subjected to analysis, the well-crystallized acid yielded figures which correspond closely with the original formula of Weber, viz.: $\text{AuCl}_3 + \text{HCl} + 3\text{H}_2\text{O}$. The loss on drying, which in no case reached 2 per cent., is attributable to hygroscopic moisture. The loss of 1 mol. of water of crystallization would amount to 4.37 per cent.—Apoth. Ztg., xxi, No. 63 (1906), 661.

OSMIUM.

Colloidal Osmium Preparations—Composition Uncertain.—C. Paal and Conrad Amberger have studied the characters of colloidal osmium preparations. To obtain them alkaline osmiat solutions were reduced by hydrazine hydrate in presence of protalbinic or lysalbinic acid sodium, but the reaction did not take place quantitatively, and the product was not elementary osmium, but an oxide or oxide-hydrate approximating in composition to the dioxide with 14.35 per cent. of oxygen. To determine the osmium in these colloidal preparations the substance was ignited in oxygen, when the tetroxide was formed. This was collected in caustic potash containing alcohol, or in dilute alcohol, and the osmium in the solution of potassium osmiat or colloidal osmium tetroxide determined. As all known methods of determining osmium quantitatively have proved more or less inaccurate, the authors tried to estimate it by the direct precipitation of potassium or sodium osmiat solution, obtained by dissolving the tetroxide in aqueous alkali solution containing alcohol, by means of dilute sulphuric acid. This method gave accurate results. Formaldehyde reduces alcoholic solutions of osmium tetroxide to the dioxide, and alcohol reduces it to the hydroxide, $\text{Os}(\text{OH})_4$; this colloidal reduction-product begins to separate out after the liquid has stood for about five or six hours, and its formation may be hastened by warming. This method may be used for the quantitative estimation of osmium. Hydrazine hydrate reduces osmium tetroxide dissolved in alcohol to a product which contains approximately the same amount of oxygen as the compound OsO_4 , but it is possibly a mixture of osmium with higher oxides.—Chem. News, May 17, 1907, 239; from Ber. d. D. Chem. Ges., xl (1907), No. 6.

ORGANIC CHEMISTRY.

CARBON COMPOUNDS.

Carbon Compounds—Terms, etc., Employed in Naming Them.—Prof. W. A. Puckner contributes a compilation of terms, syllables, prefixes and endings commonly employed in the naming of carbon compounds, which is designed for convenient consultation by students in pharmacy and medicine, and for pharmacists and physicians. The compilation is arranged in alphabetical order, beginning with the prefix “A,” and concluded with the ending “yl” in Pharm. Rev., July, August and September, 1906, 205–207, 252–256, and 281–284.

HYDROCARBONS.

(Including Volatile Oils and Derivatives.)

Benzin—*Commercial Variability and Characterization*.—Rakusin observes that in the naphtha industry "benzin" includes all fractions of petroleum boiling below kerosene (lamp petroleum), such as petroleum ether, ligroin, rigolin and gasoline. Baku benzin is sold at a higher price than Grosny benzin, because it contains a much larger percentage of low-boiling oil, as is seen from the following comparison :

	Baku Benzin.	Grosny Benzin.
Below 50° C.....	5.0 per cent.	0.6 per cent.
Below 50° to 75° C.	47.9 per cent.	15.7 per cent.
Below 75° to 100° C.....	38.0 per cent.	29.7 per cent.

Light benzin should have a specific gravity of not more than 0.717 at 15° C., and heavy benzin 0.725 to 0.729 at 15° C. It should be neutral, evaporate rapidly from filter-paper without leaving any unpleasant smell, and should contain 90 per cent of oil boiling below 95° C., and not more than 5 percent. boiling above 100° C.—Pharm. Journ., Feb. 2, 1907, 107; from Chem. Ztg., 31 (1907), 3.

Xylol—*An Efficient Remedy for Lice*.—Tabourand recommends a mixture of equal parts of xylol and spirit of ether for the destruction of lice. This mixture is applied to the infested part with the aid of a tuft of cotton, and is said to be very efficient.—Pharm. Ztg., li, No. 84 (1906), 932; from Bull. Commec., 1906, No. 9.

Alpha-Naphthol.—Characteristic reaction with *Cocaine*, which see under "Organic Bases."

Abrastol (Asaprol)—*Detection in Foods, Fruit Juices, etc.*—Prof. Henry Leffmann recommends an acid solution of mercuric nitrate for the certain and convenient determination of the complex calcium-naphthol sulphonate, introduced under the name of "abrastol" and "asaprol" as a food preservative. The reagent is obtained by dissolving mercury in twice its weight of common nitric acid and diluting the solution with five volumes of water. For testing milk, for instance, 10 Cc. of the sample are mixed with 0.5 Cc; in the presence of abrastol a yellow tint soon appears, which becomes more delicate by comparison with a blank experiment on milk known to be free from the preservative. For the examination of liquors, fruit juices and colored food products, the asaprol must be extracted from the acidified sample with ether, or benzin, etc., as in the detection of salicylic acid, and the reagent then applied to a few drops of the solution, from which the watery solution of the reagent will separate with a red tint if abrastol is present.—Proc. Penna. Pharm. Assoc., 1906, 163.

Ichthyol and Substitutes—*Composition*.—Ichthyol having for some years

been admitted into the Russian Military Pharmacopœia, in which its characters are defined in correspondence with those of the preparation originally introduced by that name, it has now become desirable to revise the definition so that it may be distinguished from the substitutes which have since been offered with the claim of identity in composition and characters. The necessary investigations having been entrusted to R. Thal. He now reports the results obtained with ichthyol (I) marketed by the original patentees, and three substitutes, two of them (II and IV) marketed under the name "ammonium sulfoichthylicum," the third (III) by a special name, which for the present purpose needs no nearer identification. These several preparations are referred to in the following by the numerals I, II, III and IV, as indicated:

The qualitative examination proved I, II and IV to be acid, and III to be neutral in reaction. All of these formed nearly clear solutions with alcohol-ether (1:1) and with alcohol-ether-water (1:1:1). When dissolved in 20 parts of water and precipitated with 4 parts of hydrochloric acid, filtrates were obtained which from I was clear and nearly colorless, with a faint sulphur-yellow tint; from III it was also clear and almost colorless, but from II and IV it was black-brown. Clear, brown solutions were obtained with I, II and IV in 80 parts of 20 per cent. acetic acid, while III was only slightly soluble. These variations in solubility permit the differentiation of ichthyol from the substitutes under consideration.

The quantitative examination gave the following results:

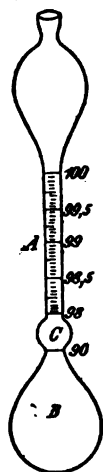
	I.	II.	III.	IV.
Dry substance	55.66	54.48	37.71	39.83
Total ammonia	3.15	5.11	1.38	3.32
Total sulphur	9.70	9.42	5.30	5.75
Ammonium sulphate	5.72	12.94	1.93	8.05
Total sulphur in the organic portions.....	17.68	15.14	13.66	11.95
Of this: <i>a.</i> In sulfonic form	6.32	8.04	4.66	7.38
<i>b.</i> In sulphidic form.....	11.36	7.11	9.00	4.57
Ammonia in the organic portion.....	3.36	4.28	2.48	3.93

—Pharm. Ztg., lii, No. 1 (1907), 8; from Russ. Mil.-Med. Journ., 1906, 228.

Camphor—Determination in Alcoholic Solutions.—Arnost recommends a method for the determination of camphor in alcoholic solutions which is conveniently carried out with the aid of the apparatus shown by fig. 41. The pear-shaped body of the flask *B*, is surmounted by a graduated tube, *A*, expanded above into a pear-shaped receptacle provided with a neck at the apex and beneath into a globular receptacle, *C*, having a capacity of

8 Cc., the scale on the stem being distinctly divided into 0.02 Cc. from the mark 98 to the mark 100. In use, the dry apparatus is placed in a water-bath at 15° C., and filled to the mark 90 with acidulated water colored red with fuchsin (5 Cc. diluted sulphuric acid to 100 Cc. of water); the solution of camphor is then added up to the mark 100 (= 10 Cc.), and after mixing the two liquids, 50 Cc. of petroleum-ether of sp. gr. 0.64–0.67 are added, the apparatus is stoppered, vigorously shaken for two minutes, and replaced in the water bath at 15° C. until the contents have completely separated into two layers (about half an hour). The reduction in the volume of the lower liquid, and corresponding increase of the petroleum ether layer, gives the volume of camphor contained in the liquid under examination; and assuming the sp. gr of camphor at 15° C. to be 0.993, the ascertained volume must be multiplied by 1.0074 to give the percentage of camphor present. If great accuracy is required, the strength of the alcohol and its contraction on admixture with water must be considered in the calculation. This is readily accomplished by the aid of tables given by the author in his original paper* in *Ztschr. f. Unters. d. Nahrungsm.*, Vol. 12 (1906), No. 9.—*Pharm. Ztg.* li, No. 89 (1906), 986.

FIG. 41.

Apparatus
for Determination of
Camphor.

Camphor—Simple Method of Estimation in the Spirit.—Beysen recommends the following simple method for the estimation of spirit of camphor, G. P.: 10 Gm. of the spirit and 10 Gm. of solution of sodium chloride (1 : 5) are shaken in a graduated cylinder with 5 Cc. of petroleum benzin. The benzin layer should be increased in volume to at least 6 Cc., and the camphor remaining after the evaporation of the benzin should have a melting-point of 175° C.—*Pharm. Ztg.*, li, Nos. 103–104 (1906), 1140; from *Ber. d. D. Pharm. Ges.*, No. 3, 1906.

Synthetic Camphor—Method of Identification.—A. Baselli recommends the following method for the identification of synthetic camphor: (1) A mixture of 1 p. camphor and 2 p. slaked lime is heated until the camphor is completely volatilized; the residue is heated with a few cubic centimeters of water to boiling, and then filtered. The filtrate, acidulated with nitric acid, should not become turbid on addition of silver nitrate. (2) Dissolve 5 Gm. of the camphor in 50 Gm. of 90 per cent. alcohol, add an aqueous solution of 5 Gm. hydroxylamine hydrochloride and 8 Gm. sodium hydroxide, and then sufficient alcohol to produce a clear solution. This solution, after heating $1\frac{1}{2}$ hours on the water-bath, should not be rendered

* It would seem that these corrections are unnecessary if before the addition of the petroleum ether the volume of mixed liquid, if reduced by contraction, be restored with water to the mark 100. Rep.

turbid on addition of water (absence of camphene or isoborneol); if the solution is neutralized with hydrochloric acid, the precipitate produced should be soluble both in an excess of the precipitant and in sodium hydroxide.—Pharm. Ztg., lii, No. 36 (1907), 373; from Ztschr. d. Oesterr. Ap.-Ver., No. 15, 1907.

Synthetic Camphor—Optical Determination.—Referring to the observation of G. & R. Fritz that synthetic camphor may be detected in spirit of camphor (which see under "Pharmacy," by its optical indifference, Utz calls attention to the possibility of producing optically active (detrorotatory) synthetic camphor, which is obtainable by the method of Hesse. This consists in converting pinene hydrochloride (bornyl chloride) into borneol and oxidation of the latter into camphor, and, consequently, an active synthetic camphor may be produced if an optically active pinene chloride is initially used. G. & R. Fritz, however, claim that the only synthetic camphor that reaches the Austro-Hungarian market, and is cheaper than natural camphor, is an optically inactive product.—Pharm. Ztg., lii (1907), No. 36, 378; from Pharm. Post. 1907, No. 16.

Synthetic Camphor—Optical Inactivity of Commercial Sorts.—In a brief review of the present state of the synthetic camphor industry it is stated in "Pharmaceutische Zeitung" that the synthetic drug is now supplied by a German manufacturing firm in a form sufficiently pure for technical purposes (celluloid manufacture) and household use—the latter in form of compressed tablets, under the name of "camphorettes," containing each about 0.5 Gm. It is also supplied in a pure (refined) form, in which it presents all the characters of natural camphor, with the exception that it is optically inactive. This optical inactivity is regarded as inherent to all synthetic compounds, even when the substance from which they are prepared possesses optical activity, and synthetic camphor is therefore proven to form no exception to the rule. It is nevertheless believed to possess the same physiological activity as natural camphor.—Pharm. Ztg., lii (1907), No. 42, 436.

Terpin Hydrate—Formula and Process of Preparation.—F. P. Robinson recommends the following formula and process for preparing terpin hydrate:

Oil turpentine.....	200 Cc.
Nitric acid, U. S. P.....	25 Cc.
Solution hydrogen dioxide	13 Cc.

Add the nitric acid cautiously to the oil of turpentine, allow the reaction to cease, and then pour in the solution of hydrogen dioxide. Set aside for several days at a temperature ranging from 15° to 20° C. (or 59° to 68° F.), the contents being stirred occasionally. As soon as the crystals cease to form, remove and press them between sheets of bibulous

paper. Finally purify the crystals by recrystallizing them from 95 per cent. alcohol.—Pract. Drugg., July, 1906, 452; from Bull. Pharm.

Thymol, Eugenol, Carvacrol, etc.—Cause of Failure to Produce Color Reactions with Ferric Chloride.—Dr. Rosenthaler has made a study of the causes that determine the failure of thymol, eugenol, carvacrol, and certain other phenols to give the characteristic color reaction of phenol on addition of ferric chloride to their aqueous solutions. He believes this to be due to the fact that these phenols do not produce sufficiently concentrated aqueous solution for the development of the ferric chloride reaction, basing his opinion upon the further fact that the salts of the phenolsulphonic acids, including those derived from thymol, eugenol, etc., give with ferric chloride the characteristic phenol color reaction.—Pharm. Ztg., li, No. 76 (1906), 839.

Thymol Iodide—Preparation.—Frederick E. Niece has found the following method of preparing thymol iodide to give satisfactory results: Dissolve 1 oz. of thymol in a solution of 1 oz. of potassium hydroxide in 1 pint of water, and 1 oz. of potassium iodide and $\frac{1}{2}$ oz. of iodine in the same quantity of water. Mix the two solutions with constant stirring and let stand some time. Make a solution of 1 lb. of chlorinated lime in 2 gals. of water, pass chlorine gas into the solution for a few minutes, and, after subsidence of the insoluble portion, strain the solution through a finely meshed cloth. To this solution, which should retain some of the fine particles of lime, add the alkaline thymol-iodine mixture, with constant stirring. Allow the copious precipitate which now forms to subside completely and wash it, first with a large quantity of water acidulated with 6 ozs. of hydrochloric acid to the gallon, and then with pure water until the washings cease to redden blue litmus. Finally, dry the precipitate at a temperature not exceeding 98° F. Yield 4 to 5 ozs. Proc. Penna. Pharm. Assoc., 1906, 151-152.

Thymol Iodide—Formula and Process of Preparation.—F. P. Robinson recommends the following formula and process for the preparation of thymol diiodide answering all the requirements of the U. S. P.:

Potassium iodide	8	Gm.
Powdered iodine	6	Gm.
Sodium hydroxide	1.78	Gm.
Thymol crystals	1.75	Gm.
Distilled water	100	Cc.

Dissolve the iodine and potassium iodide in 30 Cc. of distilled water, and then make the quantity up to 50 Cc. Make a separate solution of the thymol in sodium hydroxide, which has been previously dissolved in 30 Cc. of distilled water, and make the quantity up to 50 Cc. Now add the iodine solution to the thymol solution, with constant stirring, wash the precipitate with several changes of distilled water, and carefully dry it.—Pract. Drugg., July, 1906, 452; from Bull. Pharm.

Perfumes—Their Source and Extraction.—In a paper read before the Royal Horticultural Society (Sept. 25, 1906), Mr. John C. Umney gives an interesting description of the early history of perfumes, their source, and the methods of their extraction. While flowers have from the earliest times been cultivated for their beauty, they would be robbed of one of their greatest charms if they possessed no odor. Perfumes have been used from the very earliest times, but in the first instance appear to have been used in connection with religious ceremonies. There are very ancient references to their use. Scriptural allusions are numerous, and Herodotus (about 430 B. C.) records the presentation of an alabaster box of perfume by Cambyses, son of Cyrus, to a prince of Ethiopia. The use of perfumes appears to have gradually extended westward through the Greeks and Romans, and eventually to have been introduced into Italy, where the cultivation of flowers, in the first instance, was principally carried out in the districts round Florence, and thence was transferred to the French Riviera, principally Cannes and Grasse—the latter district having eventually become the center of the perfume industry, so that Grasse, at one time called “a small village near Cannes,” is now one of the most important places in the Riviera.

Mr. Umney, who is frequently quoted in connection with the study and investigation of volatile oils, discusses his subject lucidly and concisely under the following captions: Classification of flowers, elaboration of perfumes in plants, processes of extraction: 1. Distillation by fire, heat or steam; 2. Extraction of the petals or leaves by fats in the cold (*enfleurage*); 3. Extraction by warm effusion on fat (*maceration*); 4. Extraction with various volatile solvents; 5. Expression, as used upon the peels of lemon, bergamot, etc. Compounding (blending) of perfumes, synthetic odors, distilled waters, flower crops, commercial conditions, the world's production, cultivation in the colonies.—*Pharm. Journ.*, Sept. 29 and Oct. 6, 1906, 340 and 376.

Perfumery—Preservation in the Dark.—Dr. Willis G. Gregory lays great stress on the importance of keeping one's supply of perfume in the dark. It preserves the fulness of odor and delicacy of bouquet.—*Bull. Pharm.*, April, 1907, 164.

Volatile Oils—The Bromine Number as a Factor in Examinations.—Although the determination of the bromine number in the examination of volatile oils, proposed some years ago by Levallois and afterwards by Klimont, has not heretofore been regarded as being of importance, it has recently been practically applied in the examination of oil of turpentine, and G. Mossler has therefore undertaken the further extension of its use as a factor in examinations of other volatile oils. He has succeeded in devising a method which makes it possible to determine the exact addition of bromine and of the hydrobromic acid resulting from the reaction, which he describes in detail, together with the results obtained with a large

number of different volatile oils, in *Ztschr. d. Oesterr. Ap.-Ver.*, 1907, Nos. 15-20; from *Pharm. Ztg.*, lii (1907), No. 45, 468.

Volatile Oils—Adulteration with Artificial Esters.—C. T. Bennett calls attention to the increasing practice of using certain artificial esters for the purpose of increasing the apparent ester value of volatile oils. Such an adulterant was recently sent to Mr. John E. Umney for identification, and proved to be ethyl citrate. French lavender and bergamot oils are valued chemically by their ester-contents, and the addition of small quantities of this ester appreciably increases the apparent proportion of linalyl acetate. Ethyl citrate is almost odorless and can only be detected by chemical analysis. The characters of the sample referred to were as follows:

Specific gravity.....	1.146
Optical rotation	Nil.
Refractive index (20°)	1.4400
Range of boiling point	285°-295° C.
Saponification number	610

On account of its high boiling-point ethyl citrate will be found in the last fractions of a portion of the suspected oil submitted to distillation, and the removal of the greater portion of the oil by distillation under reduced pressure is first recommended. The residue is then saponified by aqueous potash and distilled, the distillate being tested for ethyl alcohol and the residue for citrates. The use of ethyl succinate for the same purpose has been noticed by Schimmel & Co. some years ago, and more recently the author found glyceryl acetate in a sample of American peppermint oil. Other esters which may be used for similar purposes are oxalates, tartrates, benzoates and cinnamates of the lower alcohols. These should be looked for in oils which are valued according to their ester-content.—*Chem. and Drugg.*, Nov. 3, 1906, 691.

Oil of Anise—Improved Commercial Quality.—Referring to the numerous complaints that have been voiced in the German journals concerning the substitution of anethol, official in the G. P., IV, under the title "*Oleum Anisi*," for the oil of anise formerly official, for the preparation of *Liquor Ammonii Anisatus* (which see under "Pharmacy"), Schimmel & Co. observe that a return, as proposed by some critics, to the ordinary oil of anise is not likely to overcome the difficulties complained of (separation of anethol) since the oil of anise now supplied has been so improved in quality (anethol content) that the drawbacks would be exactly the same as when pure anethol is used. On the other hand, the suggestion to amend the present formula for *liq. ammon. anis.* by increasing the proportion of alcohol, deserves serious consideration; for if the present composition is maintained, the defects observed will remain, no matter whether anethol or anise oil is used in the preparation of the liquor.—Schimmel's Report, October/November, 1906, 11-12.

Artemisia Oils—Re-examination of Several New Kinds.—Frank Rabak has distilled the volatile oils from several carefully identified species of *Artemisia*, namely *A. frigida*, Willd., *A. leudoviciana*, Nutt., and *A. caudata*, Michx., during August, 1905, in Webster, S. D., and compares their yield, properties and constants with those of the oils obtained from the same species of *Artemisia* in 1904 (see Proceedings, 1905, 753-754), and with the results of a re-examination of the latter after one and two years standing. The constants obtained are here arranged in the following table for convenient comparison :

Oil of	Distilled.	Examined.	Sp. gr.	A_D in 100 Mm. tube.	Acid-number.	Ester-number.	Sapon-number.	Sap. No. after acetylation.
<i>A. frigida</i>	1904	1904	0.927	-24° 48'	1.2	31.8	33	—
“	1904	1906	0.931	-25° 10'	3.	45.	48	143
“	1905	1906	0.933	-23° 46'	2.	35.	37	139
<i>A. leudoviciana</i>	1904	1904	0.929	-16° 14'	4.	10	14	—
“	1904	1905-6	0.930	-13° 32'	4.3	14	18.3	—
“	1905	1905	0.931	-17° 20'	0.	26	26.	116
<i>A. caudata</i>	1904	1904	0.920	-12° 30'	0.	17	17	Insufficient amount of oil.
“	1904	1906	0.887	Inactive	20	73	93	
“	1905	1905	0.8418	-24° 20'	0.	29	29	

The yields of oil were : *A. frigida*, 0.3 per cent. ; *A. leudoviciana*, 0.27 per cent. ; *A. caudata*, 0.13 per cent. Both the *A. frigida* and *A. leudoviciana* oils were soluble in $\frac{1}{2}$ volume or more of 90 per cent. alcohol, and both contained cineol. The oil of *A. caudata* formed a turbid solution with 2 volumes or more of 90-per cent. alcohol, and the 1904 oil, after standing two years, had become extremely viscid, the odor had lost its sweetness and became decidedly lemon-like, and tasted very acid.—Pharm. Rev., Nov., 1906, 324-325.

Wormwood Oil—Detection in “Liqueurs.”—L. Cuniasse, speaking of the disastrous effects known to follow the habitual use of “absinthe” and other “liqueurs” containing wormwood oil (which are attributed to the ketone, thujone, a characteristic constituent of that oil), states that the following reactions enable the presence of wormwood oil in alcoholic

solutions in the proportions of 3:1,000 to be readily detected. (1) Formation of the characteristic acetoxime with hydroxylamine and Crismer's salt. (2) Formation of the phenylhydrazine compound. (3) Formation of a precipitate with mercuric acid sulphate. The solutions of the oil in alcohol (70 per cent.) are increased in alcoholic strength three or four percentages; a corresponding volume of mercuric acid sulphate is added and the mixture is warmed on the water-bath. An abundant precipitate is formed in the presence of oils of wormwood, tansy and fennel. Anise, star-anise and hyssop oils give no reaction. (4) Production of a green color when iodine is added to the solution. The following reaction will detect the presence of 1:1,000 of wormwood oil. Ten Cc. of the solution of the alcoholic strength 50 per cent., is treated with 1 Cc. of freshly prepared 10 per cent. solution of sodium nitroprusside, a few drops of caustic soda solution, and 1 Cc. of acetic acid. With wormwood oil an intense red color is formed, also with tansy oil. Fennel, hyssop, coriander, star-anise and anise oils give no reaction, nor does acetic aldehyde in the proportion of 1:1,000.—Pharm. Journ., March 16, 1907, 331; from Journ. de Pharm. et Chim., 25 (1907) 180.

Ayapana Oil—Properties and Constants.—Under the name of "essence d'ayapana," Schimmel & Co. received from Mayotte, one of the Comoro islands, in the Straits of Mozambique, a volatile oil derived from *Eupatorium triplinerve* Vahl (*E. ayapana* Vent). This plant is indigenous to tropical Africa, and often grows wild in other tropical districts, but in the East Indies is cultivated as a tea-plant. The oil has a pale green color and a peculiar odor; sp. gr. 15°C., 0.9808; $n_D^{20} + 3^\circ 10'$; ester number 8.0—after acetylation, 23.4; soluble in 1½ vol. of 90 per cent. alcohol, but practically insoluble in 80 per cent. alcohol. The oil consists chiefly of a uniform body.—Schimmel's Rep. April, 1907, 106.

Basil Oil—Constants and Commercial Scarcity.—Schimmel & Co. observe that their endeavors to overcome the scarcity of oil of basil by inquiries in France and Réunion have been without avail. This oil, which is now so highly valued by many perfumers, has the following properties as determined in a specimen of their own cultivation and distillation: Sp. gr. at 15°C., 0.9038; optical rotation, $-9^\circ 15'$; index of refraction at 20°, 1.48132; acid number, 21; ester number, 11.6; soluble in 1.5 and more volumes of 80 per cent. alcohol, with separation of small crystals of paraffin.—Schimmel's Rep., October/November, 1906, 12.

Oil of Black Currant Buds—Properties and Constants.—Schimmel & Co. obtained from the buds of the black currant (*Ribes nigrum* L.), which had been supplied from Russia, 0.75 per cent. of volatile oil of a pale greenish color and an odor leading to the inference that it contained cymene among its constituents. It had the sp. gr. at 15°C., 0.8741; $n_D^{20} + 2^\circ 30'$; n_D^{20} 1.48585; acid number, 0; ester number, 5.6; soluble

in 6.5 and more vols. of 90 per cent. alcohol with slight cloudiness, which disappears on greater dilution.—Schimmels' Rep., April, 1907, 106.

Calamintha Oil—Characters and Composition.—Having secured 2 kilos of an oil distilled from the herb of *Calamintha nepeta* Clairv., which, as mentioned in their Report for April, 1903, is placed on the market from the south of France under the name of "Essence Marjolaine" or "oil of sweet marjoram" (see Proceedings 1903, 888), Schimmel & Co. have subjected it to examination. It is of a bright, greenish-yellow color and has a mint-like odor; sp. gr. at 15° C., 0.9271; optical rotation, + 6° 49'; ester number, 13.0; soluble in 2.7 vol. and more of 70-per cent. alcohol. Subjected to fractionation, the fraction, boiling at 208° to 209° C. under ordinary pressure, was treated separately with the purpose of separating the new ketone, *calaminthone*, described by Genvresse and Chablay as being a constituent of this oil. The results show that this ketone is not a uniform body, but most probably a mixture of pulegone and menthone.—Schimmel's Rep., October–November, 1906, 14.

Japanese Cinnamon Oil—Constituents.—K. Keimatsu has determined the constituents in the oils distilled from the leaves, trunks and roots of *Cinnamomum loureirii* Nees., grown in the Japanese province Ki-i, to be as follows: In the oil from the leaves, citral and small quantities of eugenol; in the oil from the trunks, cinnamic aldehyde and also small quantities of eugenol; in the oil from the roots, cinnamic aldehyde, together with camphene, cineol and linalool. These results agree with those previously obtained by Schimmel & Co. with the oil of the twigs and leaves of the same Japanese plant, described at the time as oil of nikkei (see Proceedings 1905, 768).—Schimmel's Rep., October–November, 1906, 23; from Journ. Pharm. of Japan, 1906, 105.

Oil of Champaca-blossoms—Properties and Constants.—After many fruitless attempts, Schimmel & Co. have succeeded in discovering a reliable source of supply of oil of champaca-blossoms, and expect shortly to receive a sufficient supply to take up the scientific examination. The limited supply received exhibited the following characters and constants: A bright-brown oil showing, especially in alcoholic solution, a very feeble bluish fluorescence, possibly due to anthranilic acid ester; sp. gr. at 15° C., 0.8861; optical rotation, —11° 10'; acid number, 10.0; ester number, 21.6 and, after acetylation, 150.1; soluble in 2 vols. of 70 per cent. alcohol, but becoming strongly turbid when 4 more volumes were added; soluble also in 1 vol. of 80 per cent. alcohol, but becoming opalescent, owing to separation of paraffin, when more than 7 vols. are added. Linalool appears to be present in the oil.—Schimmel's Rep., Oct.–Nov., 1906, 23.

Algerian Dittany Oil—Probable Source, Characters, Etc.—Schimmel & Co. describe a new volatile oil received from Oran (Algeria) under the name of "Essence de Dictame ou Calament," which corre-

sponded in its properties with the *Calamintha Oil* recently described by them (which see), but also resembled the oil of European pennyroyal. Notwithstanding that the plants accompanying the sample were incomplete, it seems justified to identify *Amaracus dictamnus* (L.), Benth. (*Origanum dictamnus* L., dittany), as the probable source of this oil, which had the following properties: It had a yellowish color and a strong odor of pulegone; sp. gr. at 15° C., 0.9331; optical rotation, + 3°; soluble in 2.7 vol., 70 per cent. alcohol with faint opalescence, increasing with more alcohol, and in 1.5 vol. and more of 80 per cent. alcohol, becoming cloudy when 14 vols. are added. It contains about 85 per cent. pulegone with a rotatory power of + 20° 10'.—Schimmel's Report, October/November, 1906, 83.

Oil of Erigeron Canadensis—Comparison of Characters and Constants with those of an Older Sample.—From the fresh herb of *Erigeron Canadensis* subjected to distillation at Webster, S. D., during August, 1905, Frank Rabak obtained 0.52 per cent. of volatile oil, which he has subjected to examination and comparison with oils distilled by him at the same place from both the dried and the fresh herb in 1904 (see Proceedings, 1905, 759). The odor of the oil of 1905 is caraway-like, also reminding of limonene. The taste is at first not unpleasant, but gradually becomes intensely acid; soluble in 2 volumes of 90 per cent. alcohol, yielding a turbid solution; sp. gr. 0.8567; d_4^{20} , —82° 10'; acid number, 0; ester number, 39; saponification number, 39; saponification number after acetylation, 67. Whereas the oil from the dried herb of 1904 showed a higher rotation than that from the fresh herbs, the 1905 oil from the fresh material possesses even a higher angle of rotation than that from the 1904 dry herb. Tests for aldehyde gave positive results with both the 1904 and 1905 oils.—Pharm. Rev., Nov., 1906, 326.

Oil of Evodia Simplex—A New Volatile Oil from Réunion.—Schimmel & Co. have received and describe for the first time a volatile oil distilled in Réunion from *Erodia simplex* Cordem., a rutaceous plant closely allied to *Toddalia aculeata* Pers., and obtained both from the leaves and bark of the root. It is a yellow-green, mobile oil having a pleasant, not obtrusive odor, but in the present sample strongly reminding of Réunion geranium oil, due, according to the manufacturer, to the use of stills employed in the geranium oil production. Its sp. gr. at 15° C. is 0.9737; optical rotation, —13° 4'; ester number, 16.4—after acetylation, 63.3; soluble in 0.9 vol. of 80-per cent. alcohol with a slight separation of paraffin, but not completely soluble in 10 vol. of 70-per cent. alcohol; in freezing mixture separates a very few colorless scales, but does not solidify. Eugenol methyl-ether and a paraffin melting at 80° C. to 81° C. have been determined among the constituents of this oil.—Schimmel's Rep., October–November, 1906, 82.

Indian and Ceylon Grass Oils.—New systematic classification of plants yielding them. See *Andropogon* or *Oil Grasses* under "Materia Medica."

Palmarosa and Ginger grass Oils.—Probable Source from Identical Species of Oil-grasses.—In discussing Dr. Stapf's monograph on *oil-grasses* (which see under "Materia Medica"), Schimmel & Cq. had mentioned that opinions differ greatly as to whether the two rush grasses known in the vernacular as "motia" and "sofia" are different varieties, or one and the same plant in different stages of maturity. They are now in a position to supply a further contribution to this topic, from which it may be seen to what extent the existing views on the two grasses contradict each other, and what difficulties a solution of this question presents. Having received specimens each of "sofia" and "motia" plants, together with the volatile oils belonging to them, from Mr. Burkill, of the Indian Museum of Calcutta, the oil from the "motia" was identified to be a *palmarosa oil*; that from the "sofia," on the other hand, proved to be a *ginger-grass oil*. Both distillates possess the odors and characteristics of the respective oils, and by these means alone could be easily distinguished from each other. When, however, the grasses accompanying these oils were submitted to Dr. Stapf, who kindly consented to identify them, he proved that the plants could not be distinguished morphologically, but that both belong to the narrow leaved form of *Cymbopogon martini* Stapf. How it comes about that these grasses should yield oils which differ totally from each other is a mystery that can be cleared up only by further reliable observation on the spot.—Schimmel's Rep., April, 1907, 58.

Ceylon Citronella Oil.—Inferiority Due to Variety of Plant Cultivated.—In a comprehensive article relating to the citronella oil industry in Ceylon, Mr. B. Samaraweera * remarks that the history of the citronella plant is shrouded in darkness, and the most varied opinions prevail on the origin of the different varieties. The mother plant, as is well known, is *Andropogon nardus* L.; the four different varieties which occur are separated into two groups, viz., "mahapangiri" and "lanabutu," of which each has its advantages and disadvantages. The former gives a rich yield of oil, which is greatly valued on account of a high content of aromatic substances; but the plant requires a comparatively rich soil and much care, as it has to be transplanted frequently. The "lanabutu" gives a smaller yield of oil, which is less aromatic, and consequently of less value; on the other hand, the plant thrives in a poor soil and does not require transplanting. The bulk of the oil produced in Ceylon originating from "lanabutu," it is obvious that Ceylon citronella oil has a smaller com-

* By an error of the reporter present at the meeting of the Agricultural Society of Ceylon, the name of A. Jayasuriga, who represented Mr. Samaraweera, was given as the author of this paper, which has accordingly been corrected. See Schimmel's Rep., April, 1907, 36.

mercial value than Java and Singapore citronella oils, which are produced from the better variety. According to the author's experience, adulterations are not responsible for the low price of Ceylon citronella; he seeks the cause of the inferior quality of the oil in the variety of plant cultivated, the low price also in over-production, and suggests that to place Ceylon oil on an equal footing with the other oils, it will be necessary to cultivate a better variety.—Schimmel's Rep., October–November, 1906, 24; from Oil, Paint and Drug Rep., 70 (1906), 25.

West Indian Lemon-grass Oil—Characters.—J. C. Umney and C. T. Bennett observe that West Indian lemon-grass oil differs markedly from the East Indian oil, but whether this difference is due to climatic conditions or to the use of a different variety of andropogon is not certain. A typical sample which the authors have recently investigated had the sp. gr. 0.879 and contained 75 per cent. of aldehydes. It was not soluble in 70 per cent. alcohol, and this insolubility characterizes the West Indian distillate. Comparative fractionations of the two kinds of oil have given the following figures:

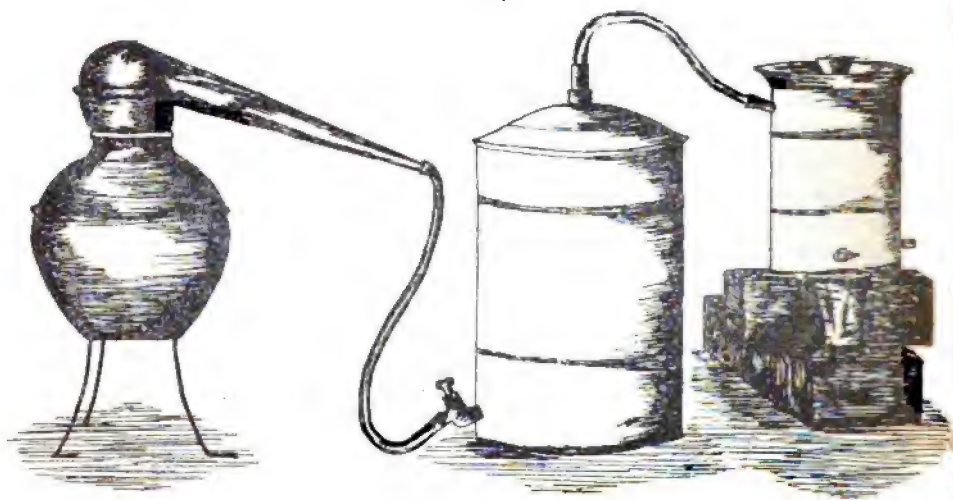
	West Indian.	East Indian.
	Per Cent.	Per Cent.
Below 180° C.....	Nil	Nil
Below 190° C.....	6	Nil
Below 200° C.....	12	Nil
Below 210° C.....	23	Nil
Below 220° C.....	46	20
Below 225° C.....	60	64
Below 230° C.....	82	82

The West Indian oil, therefore, contains more of the lighter fractions, while fractionations under reduced pressure show marked differences from the East Indian oil, the optical behavior of the fractions being *nil*, whereas those from the latter oil showed rotations of -12° , -2° , -2° and -3° , in the five fractions obtained.—Chem. and Drug., Jan. 26, 1907, 138.

Volatile Oil of Hedeoma—A Novel Steam Still.—J. G. Bennett in the course of class pharmaceutical work at Lima College, distilled the volatile oil of hedeoma from the fresh herb gathered in the woods of Allen County, Ohio, using for this purpose the apparatus shown by Fig. 42. The still proper consisted of a gasoline container, having a capacity of 900 to 1200 grams of the freshly picked pennyroyal stems, leaves and root. A small still with alembic furnished the steam, being connected, as shown, by means of a rubber tube. The distillate was collected in a graduate after passing through an ordinary condenser. The yield of oil, dried over calcium chloride, was 0.166 per cent., or 0.198 per cent. calculated for the leaves and tops alone—the stem and roots amounting to 16 per cent. of the plant and containing no oil.—Midland Drugg., November, 1906, 213.

Volatile Oil of Juniperus Chinensis—*Characters*.—H. Kondo has subjected the volatile oil of *Juniperus chinensis* to examination, and finds it to resemble the volatile oil of *Juniperus virginiana* very closely in its chemical constituents, although differing somewhat materially in its physical characters. The cedrol and cedrene proved to be chemically identical with those isolated from *J. virginiana*. Furthermore, the author finds

FIG. 42.



Distilling Volatile Oil of Hedeoma from the Fresh Herb.

that the oil from *J. chinensis* is quite as suitable for microscopic purposes as is the cedar-wood oil hitherto employed.—Pharm. Ztg., lii (1907), No. 47, 489; from Journ. of Pharm. Soc. of Japan, March, 1907.

Oil of Juniper Needles—*Yield and Characters*.—R. E. Hanson and E. N. Babcock distilled in the beginning of May the oil from the leaves and branches of *Juniperus communis* L., from which the berries had been removed. They obtained from 0.15 to 0.18 per cent. of a bright yellow oil, sp. gr. at 15° C., 0.8531, which had a characteristic odor of juniper. In this connection, Schimmel & Co. mention an

Oil of Juniper Berries and Needles, which they distilled from material recently received from Russia. This showed the following behavior: d_{150} 0.8675; $a_D + 8^\circ 46'$; ester number, 11.4; soluble in six and more volumes of 90 per cent. alcohol, with slight turbidity. It differs from the ordinary distillate of juniper berries only by the dextrogyration, and in this respect with two Russian juniper oils previously reported and discussed, which had therefore probably been produced from the same material.—Journ. Amer. Chem. Soc., 28 (1906), 1198, and Schimmel's Rep., April, 1907, 60.

Lavender Oil—Practical Observations Concerning its Distillation.—Schimmel & Co. give some practical information concerning the proper time and selection of material, the method of distillation, and the conditions which favor the yield and quality of lavender oil. The distillation takes place during the time when lavender is in full bloom—from the beginning of July to the beginning of September—the whole inflorescence, including the upper green parts of the plant, being used, but the woody parts are rejected, since they contain little or no oil at all. The old method of water distillation results in a loss of esters, while distillation by steam has not alone the advantage of rapidity of distillation, which is important for the preservation of the ester content, but the yield is somewhat greater. With fresh blossoms the yield of oil is 0.8 per cent., with dried blossoms up to 1.5 per cent., but during drying the blossoms lose a great deal in weight—from 35 to 47 per cent., according to the length of time occupied. Not only a portion of the water is thus lost, but also a portion of the oil, as was proved by calculating the oil yield for the fresh distillation material. As, moreover, dried lavender yields an oil of greater specific gravity and richer in ester than the same lavender in the fresh state, it follows that the blossoms thus practically only become poorer in the most volatile portions of the oil (terpenes). The following table may serve to make this clear:

Kind of Lavender.		Loss in Drying.	Yield of oil Calculated for Fresh Blossoms.	d_{15}^0	n_D^{20}	Per Cent. Ester.	Solubility in 70 per cent. Alcohol.
1.	(a) Fresh blossoms		0.84%	0.8891	$-7^{\circ} 25'$	50.3	Soluble in 6 and more vols. with slight cloudiness, with 10 vols. still opalescent.
	(b) The same after drying for $1\frac{1}{2}$ days	35%	0.79%	0.8905	$-7^{\circ} 33'$	51.3	
2.	(a) Fresh blossoms		0.87%	0.8859	$-9^{\circ} 4'$	46.9	Soluble in about 4.5 and more vols. with opalescence.
	(b) The same after drying for 4 days	47%	0.79%	0.8884	$-9^{\circ} 33'$	49.2	
3.	(a) Fresh blossoms		0.80%	0.8375	$-8^{\circ} 10'$	47.1	Soluble in 3 and more vols.
	(b) The same after drying for 5 days	47%	0.72%	0.8399	$-8^{\circ} 44'$	51.1	

Small losses of ester also occur when lavender blossoms are dried, but they are only slight, and amount to between 10 and 25 per cent. of the total loss of oil. It follows from all that has been said on the distillation of lavender that the oil richest in ester, and at the same time the largest yield of oil, are obtained when the lavender blossoms are worked

up in an entirely fresh condition, and are distilled with steam as rapidly as possible.—Schimmel's Rep., April, 1907, 764.

Lavender and Spike Oils—Influence of Cross-fertilization of the Respective Plants Upon their Constituents.—In a work on the influence which the cross-fertilization of lavender and spike has on the volatile oil of these plants, A. Birckenstock deals also with the ester question, regarding the ester-content as being highly important for the valuation of lavender oil; but, although the estimation of the various qualities on the basis of their linalyl-acetate content is applicable as a rule, he has observed that there are also good lavender oils which contain only 20 to 30 per cent. of this ester. Such oils are found in the Alps near the Franco-Italian frontier, and the annual production (about 5000 kilos) is in the author's opinion of sufficient importance to take the particular properties of these oils into account. They have a very fine bouquet, but no "body." The content of linalool amounts to about 50 per cent., and is therefore normal, but, as mentioned, the ester-content is only 20 to 30 per cent. They are furthermore characterized by a low specific gravity (0.876 to 0.882), by a considerable lævogyration (-8° to -9°), and by being very soluble in 60 per cent. alcohol (in 10 to 12 vols.) A further exception to the rule is due to hybridization, producing varieties of plants standing between lavender and spike. If namely, lavender is cultivated below 2300 to 2600 feet, it crosses with spike; the hybrids thus formed, known among distillers by the names "*lavandin*" and "*spigoure*" respectively, representing every possible transition between lavender and spike, and depending on altitude and state of soil. The influence of this cross-fertilization not only manifests itself by morphological differences in the plants, but also in the properties of the oils distilled from the hybrids, which behave entirely like mixtures of lavender and spike oils. The author has in the course of his observations examined a whole series of oils, from typical lavender oil to typical spike oil, and found that towards lavender oil not only the ester-content and alcohol-content increase, but that also a gradual change takes place in the proportion of borneol to linalool and geraniol; for, whereas in spike oil the borneol predominates, it diminishes in the "*lavandin*" oils more and more, compared with linalool and geraniol, as they approach typical lavender oil. Schimmel & Co., commenting on these observations of Birckenstock, remark that, inasmuch as "*lavandin*" oil is no longer the oil of the actual lavender plant, but of a hybrid, it is a matter of no concern to the trade whether it is a question of lavender oil adulterated with spike oil, or of an oil which may be pure, but yet behaves exactly like an adulterated oil.—Schimmel's Rep., October-November, 1906, 43-45; from Monit. scientif. de Quesn., May, 1906.

Linaloe Oil—Percentage of Linalool.—Referring to the findings of Parry and Bennett, that "the great majority of samples today of the finest

(linaloe) oil imported, and believed to be above suspicion, do not contain more than 70 per cent. of linalool" (see Proceedings, 1906, 880), W. H. Simmons records observations and experiments, which seem to prove that the above-named authors did not sufficiently take into account the somewhat large loss of linalool brought about by the process of acetylation which is employed there. Following a process recently recommended by Brulez ("Les Corps Gras," 1907, 178), more satisfactory results were obtained. This consists briefly, in diluting 5 grams of the oil with 25 grams of turpentine, and boiling with 40 grams of acetic anhydride and 3 to 4 grams of fused sodium acetate for three hours, then washing, drying and saponifying with potash in the ordinary way, a blank experiment with the turpentine being carried out at the same time. By allowing for the "alcohol value" of the turpentine, that of the oil under examination can be readily calculated. In this way Brulez has obtained the following results compared with those given by the ordinary process :

—	New Method	Old Method
	Per Cent.	Per Cent.
Linalool.....	98-100	50
Linaloe oils	80-90	40-50

The results obtained by Mr. Simmons confirm the accuracy of the process as shown in the following :

—	New Method	Old Method
	Per Cent.	Per Cent.
Linalool.....	100	68.5
Linaloe oil	88	62

—Chem. & Drug., March 30, 1907, 496.

Oleum Macidis, Phar. Nederl.—*Correction of Boiling-Point.*—The new edition of the Dutch Pharmacopœia requires that at least one half of the oil of nutmeg should distill over between 110° and 130° C., another portion between 130° and 150° C., and the rest above 200° C. Th. Hovgenbrom now points out that in the distillation of a freshly prepared, pure oil, over one-half passed over between 164° and 175° C., one-fourth between 175° and 198° C., and that during the distillation of the remainder, the thermometer rose up to 235° C.—Pharm. Ztg., li, No. 71 (1906), 788; from Pharm. Weekbl., 1906, No. 28.

Oil of Mentha Rotundifolia—Properties and Constants.—Schimmel & Co. describe an oil of *Mentha rotundifolia* L., received from Algeria. It had a dark orange yellow color, and a musty, faint, somewhat pungent odor, distantly resembling that of spearmint oil; sp. gr. at 15° C., 0.9777; n_D —37°30'; acid number, 1.5; ester number, 71.2; after acetylation 209; soluble in 1 vol. 80 per cent. alcohol, becoming strongly cloudy on dissolution, but miscible in all proportions with 90 per cent. alcohol.—Schimmel's Rep., April 1907, 107.

Russian Spearmint Oil—Constants.—Schimmel & Co. have had the opportunity of determining the constants in a spearmint oil from Russia, which, as is known, differs from the American and German distillates chiefly by its high linalool-content, and its low content of carvone. The sample examined had a stale, feeble odor like spearmint; sp. gr. at 15° C., 0.8873; optical rotation, —25°16'; index of refraction, 1.47078; acid number, 1.1; ester number, 15.9; solubility, in 2.2 vols. and more 70 per cent., and 1 or more vol. 80 per cent. alcohol. The American and German distillates, in distinction from these constants, show the sp. gr. at 15° C. of 0.92–0.94; optical rotation, —36° to —48° C.; soluble, in 1 vol. and more 80 per cent. alcohol, the dilute solution having a faint opalescence. Schimmel's Rep., October-November, 1906, 73.

Oil of Myrrh—Variation According to Source and Method of Preparation.—According to the investigations of K. Lewinsohn the volatile oil of myrrh varies in its composition according to the source of the gum resin and the method of its preparation. Cumin-aldehyde was found up to the amount of 1 per cent. Eugenol and small quantities of m-cresol were found in all sorts of the oil, and in the older oils, which reacted acid, also free acetic and palmitic acids. The oil furthermore contains pinene, dipentene, limonene, and two sesquiterpenes, one of them probably cadinene.—Pharm. Ztg., li, No. 71 (1906), 788.

Orange Oils—Correction of Constants.—According to the results of detailed examinations made in the last few years with numerous authentic orange oils, Schimmel & Co. have now fixed the following values for bitter and sweet orange oils in the place of those given (by them) in Gildemeister and Hoffmann's work, "The Volatile Oils":

Bitter Orange Oil: Sp. gr. at 15° C., 0.854 to 0.857; n_D 20° C., +90° to +98°; n_D of the first 10 per cent. of the distillate higher than n_D of the original oil; residue on evaporation, 3 to 5 per cent.

Sweet Orange Oil: Sp. gr. at 15° C., 0.848 to 0.853; n_D 20° C., +95° to 98°; n_D of the first 10 per cent. of the distillate not, or but little, lower than n_D of the original oil; residue of evaporation, 2 to 4 per cent.

These changes in value are believed to be due to greater care in the selection of fruit and the expression of the oil.—Schimmel's Rep, October-November, 1906, 34.

Cyprus Origanum Oil—*Botanical Source and Characters*.—Diomedes Saracomenos says that the distillation of what is known in Cyprus as origanum or red thyme oil has now been systematically carried out in the island for five to six years. The raw material is a plant which grows wild in the southwest portion of the island, but the exact species of *Origanum* to which the plant belongs has not yet been definitely identified, although generally regarded to be *Origanum hirtum* or *O. onites*, both of which are known to grow wild on the island. The distillation operations are carried out in a sheltered and shady spot by the side of a stream and without any special buildings. Distillation lasts from July to the middle of December. It could be continued even beyond this season, but as there is no proper accommodation the work becomes difficult, besides more fuel and higher wages would be needed. The oil obtained from fresh plants is of a dirty gray color. Plants left in store for one month will yield an oil of a dirty red color, which color the oil, if distilled from fresh plants, also assumes in course of time. Mr. Francis, government analyst, who has analyzed the oil, reports upon it as follows:

NO. 1.—DARK-COLORED OIL.

Specific Gravity 0.969.

Water.....	2.60
Light oil distilling under 160° C.....	1.80
Thymene distilling between 160° and 165° C.....	6.40
Cymene distilling between 170° and 180° C.....	7.60
Thymol distilling at 230° C.....	81.60
	<hr/> 100.00

NO. 2.—LIGHT-COLORED OIL.

Specific Gravity 0.969.

Water	2.00
Light oil distilling under 160° C.....	2.00
Thymene distilling between 160° and 165° C.....	2.40
Cymene distilling between 170° and 180° C.....	8.80
Thymol distilling at 250° C.....	84.80
	<hr/> 100.00

It will be seen from the above analysis that the oil consists chiefly of a mixture of thymol with the hydrocarbons thymene and cymene. It is colorless when freshly distilled, but becomes deep red on keeping. Sometimes when the distillation is forced the distillate comes over colored. English oil generally has a density of 0.87 to 0.90, but the Cyprus oil is heavier, as it has a large percentage of thymol. The chemical analysis of the oil made by Professor Dunstan, Director of the Imperial Institute, London, showed a phenol content of 82.5 per cent. by volume. The phenol was extracted from the oil by the usual methods, and, after careful examination, was identified as carvacrol, which is a liquid isomeride of the better-known solid, crystalline substance thymol, generally present in French white-oil thyme obtained from *Thymus vulgaris*. It is pointed

out by Professor Dunstan that the presence of carvacrol is an advantage which the Cyprus oil has over the French and Spanish thyme oils, lending itself particularly well to the manufacture of soap on account of the high content of this odorous and antiseptic constituent.—Chem. News, March 9, 1907, 365-366.

Pastinaca Oils—Yield and Characters as Obtained from Different Parts of the Plant.—Schimmel & Co. obtained by steam distillation the volatile oils from the ripe dried seeds, the dried umbels and the dried roots of *Pastinaca sativa* L., cultivated at Miltitz, with results as follows: *From the seed*, 1.47 per cent. of a bright yellow oil; sp. gr. at 15° C., 0.8736; optical rotation, — 0° 9'; index of refraction, 1.43007; acid number, 4.4; ester number, 240.6; ester number after acetylation, 276; soluble in 2½ and more vols. of 80 per cent. alcohol. *From the umbels*, 0.3 per cent. of a dark brown oil, having a very remote odor of oil of ambrette seeds; sp. gr. at 15° C., 1.0168; optical rotation, — 0° 50'; index of refraction, 1.50049; acid number, 4.2; ester number, 62.9; ester number after acetylation, 86.2; soluble in 6.5 vols. of 80 per cent. alcohol, with separation of paraffin. *From the roots*, 0.35 per cent. of a bright yellowish oil, having an odor reminding somewhat of vetiver oil; sp. gr. at 15° C., 1.0765; optical rotation, — 0° 10'; index of refraction, 1.52502; acid number, 3.9; ester number, 12.6; ester number after acetylation, 33.7; not completely soluble in 10 vol. of 80 per cent. alcohol, but soluble in 0.6 or more vol. of 90 per cent alcohol.—Schimmel's Rep., October/November, 1906, 51.

Oil of Persea Gratissima—Characters and Constituents.—Schimmel & Co. have determined the constants and chemical constituents of an oil distilled from the leaves of a specimen of *Persea gratissima* Gaertn. growing in a garden at Cannes. The oil had a very faint yellowish-green color, bitter taste, and odor reminding of anise and remotely of estragon; sp. gr. at 15° C., 0.956; opt. rotation, + 2° 22'; index of refraction, 1.51389; ester number, 3.8—after acetylation, 18.9; soluble, with slight cloudiness, in 6 vols. of 80-per cent. alcohol, but forms a clear solution with about ¼ vol. and more of 90-per cent alcohol. Becomes cloudy in a freezing mixture, but does not congeal. Confirming a previous determination, made in 1894, the oil of *Persea gratissima* is shown by the present investigation to consist for the largest part of methyl chavicol; it contains also d-pinene and paraffin-like substances.—Schimmel's Rep., October–November, 1906, 59.

Oil of Picea Excelsa Cones—Properties and Constants.—From the one-year-old fruit-cones of the Norway spruce, supplied from Thuringia, Schimmel & Co. obtained a distillate which in the rectified state had the following constants: d_{15}^0 , 0.8743; n_D — 19° 15'; acid number, 1.8; ester number, 3.9 = 1.4 per cent. ester, calculated for bornyl acetate; soluble in 7 and more vols. 90-per cent. alcohol. The oil had a greenish-yellow color, and contrary to the other conifer oils had a somewhat stale, musty odor.—Schimmel's Rep., April, 1907, 85.

Pilea Oil—*A New Volatile Oil from Réunion*.—Schimmel & Co. describe a new volatile oil obtained from an unused species of *Pilea* indigenous to Réunion. It is a water-white, very mobile liquid, having a turpentine-like but not disagreeable odor; sp. gr. at 15° C., 0.8533; optical rotation, +33° 53'; index of refraction, 1.46862; ester number, 5.1, after acetylation, 24.2; soluble in about 5 and more volumes of 90 per cent. alcohol. Although containing some pinene, the bulk of constituents has not been determined.—Schimmel's Rep., October–November, 1906, 83.

German Oil of Rose—Constants.—Schimmel & Co. have determined the constants in oil of rose distilled from flowers grown in their Miltitz plantations: d_{4}^{20} 0.8444; $a_{D_{360}}^{20}$ —0° 23'; $n_{D_{360}}^{20}$ 1.46139; solidifying point, +30.8°; acid number, 4.3; ester number, 5.2; ester number after acetylation, 178.8, corresponding to 56.8 per cent. $C_{10}H_{18}O$; paraffin content about 42 per cent.—Schimmel's Rep., October–November, 1906, 67.

Attar of Rose—Method of Distillation in Bulgaria.—J. Carlton Wolf speaks interestingly of the cultivation of roses and the distillation of the oil in Bulgaria, an industry which still leads the world, notwithstanding the fact that roses are and have been cultivated for this purpose in India, Persia, Germany and the Maritime Alps. Two varieties of roses are grown in Bulgaria for attar purposes—the white musk rose, and the half-double, pale pink *Rosa damascena*, this latter kind yielding much richer odor and better quality of oil. The planting of a rose-garden is similar to a vineyard. The first crop is gathered in the third year and thereafter, when the plants have reached mature growth (a height of about six feet), very rich crops are obtained for a period of about twenty-five or thirty years. The harvest begins about the middle of May and lasts for a period of fifteen or thirty days, according as the weather is dry and hot, or cool and rainy.

The Distillation is begun with the first gathering, and is conducted during the entire harvest. The stills, of which there are some thirteen thousand in use, are of very simple design, and are those practically used for the last fifty years. They consist, as a rule, of a tinned copper boiler, narrowed at the top to a neck, on which is fixed a spherical head-piece with a tube on one side. To this is attached the condensing tube that slopes down and passes through the condenser, which is usually a large barrel into which cold water is constantly running. These boilers generally have a capacity of about thirty gallons. From twenty to twenty-five pounds of roses are put into the still, and then from fifteen to twenty gallons of water thus filling the boiler about three-quarters full. This done, the head piece and condensing tube are tightly attached, the fire started beneath the boiler, and the distilling commenced. This is carried on until about five gallons of rosewater has been extracted from each boiler. The vessels are then emptied, cleansed with pure water, and the same process repeated until all the morning gathered flowers have been distilled.

The Rosewater extracted during the first distillation is re-distilled in the same manner, using about one hundred and thirty pounds at a time, from which is obtained thirty to thirty-five pounds of second rosewater. This doubly-distilled water is extremely strong in odor and very turbid in appearance, being full of tiny yellow-white globules. As the rosewater is led into long-neck bottles, these globules, which are the Attar of Rose gather on top, and then are skimmed off and put into separate containers. Most of the roses are distilled by the peasants themselves in the town near which they are grown, until forty years ago the peasants knew nothing about adulteration, and the Attar of Rose industry was ideal in its purity. Modernly, they have learned to increase the product by the addition of geranium oil during the distillation of the roses.—Proc. Maryland Pharm. Assoc., 1906, 66-69.

Otto of Rose—Increasing Practice of Adulteration.—Ernest J. Parry says that he has had the opportunity of examining a very large number of samples of otto of rose during the past six months, and has never, since the time when this article has been regularly admitted to chemical analysis, known its adulteration to be so bad as at present. From the experience of many years' crops, and from samples taken from all over the rose-gathering areas, he is convinced that a pure otto of rose never (that is, when distilled in normal Bulgarian fashion) has a specific gravity over about 0.855. It usually falls between the limits 0.850 and 0.853 at 30° C., and anything over this is at once suspicious. The author gives the figures obtained with fifteen samples examined during the past few months, which demonstrate the character of adulteration that is going on at present, and make it clear that at present otto of rose requires careful watching. The possible exception to the rule that high specific gravity indicates adulteration, is that of oils distilled *in vacuo*. It is certain that the otto of rose so obtained has characters quite different from the product obtained by the normal method usually followed in Bulgaria; it contains a large amount of phenyl-ethyl alcohol, which gives to the otto its abnormally high specific gravity.—Chem. and Drugg., Aug. 4, 1906, 230.

Rosemary Oil—Influence of Time of the Year on the Quality.—The investigations of A. Birckenstock appear to prove that the time of the year influences the quality of the oil contained in rosemary. In order to show that rosemary plants from the same ground and soil (Hérault), worked up under exactly the same conditions, yield oils of different rotatory powers, distillations were carried out in April, July and November. The oils obtained, respectively showed the following optical behavior: April, +6° 32'; July, +8° 17'; November, +11°; while two samples of rosemary oil, the one distilled in April, the other in June, from plants grown at Cannes (*Alpes maritimes*), showed respectively the rotations: -0° 57' and +5° 57'. These observations point out that the view, that levorotatory rosemary oils are adulterated with turpentine oil, does not always

apply, if the specific gravity of the oil is sufficiently high.—Schimmel's Rep., October/November, 1906, 69; from Monit. scientifique de Quesn., May, 1906.

Oil of Rue—Distinctions Between French and Algerian Oil Due to Season.—The investigations of A. Birkenstock point out that the well-known differences in the composition and congealing points of French oil of rue (*Ruta graveolens* L.) and the Algerian oil, are due to the season in which the oils are distilled. Both oils contain about 90 per cent. of ketones, but the French oil almost exclusively methylamyl ketone (m. p. $+15^{\circ}$), while the Algerian oil contains methylheptyl ketone (m. p. -16°), although no morphological characters of distinctions exist in the plants yielding them. The author has now distilled Algerian oil of rue at three different periods of vegetation, and has shown that when the Algerian oil, like the French, is distilled from the plants in autumn, it has exactly the same composition and the same properties as the French oil of rue. Commenting on these observations, Schimmel & Co. call attention to a recent examination of two Algerian oils of rue, by H. Carette, which show marked characters of distinction: the one, designated as "Summer Rue Oil," the other as "Winter Rue Oil," and distinguishable from each other by the congealing points and characters of their constituent ketones.—Schimmel's Rep., October/November, 1906, 70; from Monit. scientif. de Quesn., May, 1906.

Sage Oil—Ester Value.—F. J. Parry observes that it is difficult to find any sage oil which answers the usual standards laid down in text-books. While these statements agree well with regard to specific gravity (0.915 to 0.930) and optical rotation ($+10^{\circ}$ to $+25^{\circ}$), no mention appears anywhere of the discovery of any ester in the oil, notwithstanding that Schimmel & Co. mention the high saponification value 107. The author has recently examined twelve samples of sage oils exported from Spain by reliable firms, but otherwise unauthenticated, and all described as sage oils, and obtained the following figures:

Specific Gravity.	Optical Rotation.	Ester Number.
0.907	$+8^{\circ}$	22
0.911	$+7^{\circ}$	20
0.918	$+11^{\circ}30'$	25
0.903	$+8^{\circ}$	21
0.910	$+7^{\circ}30'$	18
0.921	$+18^{\circ}$	37
0.927	$+22^{\circ}$	39
0.918	$+17^{\circ}30'$	33
0.922	$+16^{\circ}$	21
0.919	$+25^{\circ}$	31
0.918	$+14^{\circ}20'$	30
0.917	$+15^{\circ}30'$	28

—Chem. & Drugg., February 16, 1907, 263.

Oils from Needles, Cones and Branches of American Conifers—Yields and Properties.—R. E. Hanson and E. N. Babcock have examined the oils from the needles, cones and branches respectively of some American conifers with results which are here mentioned in brevity as follows:

Picea Mariana, "black spruce." The yield of oil from the needles amounted to 0.57 per cent.; d_{190} 0.9274.

Tsuga Canadensis, "hemlock." The needles and branches gave a yield of 0.4 per cent. to 0.46 per cent. of oil; d_{150} 0.9238 to 0.9273.

Picea Canadensis, "cat spruce." Of this species, needles and cones were distilled. The former yielded 0.103 per cent. oil; d_{150} 0.9216; 25.7 per cent. ester, calculated as bornyl acetate. The odor of the oil points to the presence of limonene or dipentene. The cones yielded 0.25 per cent. of a yellow oil, also with a limonene-like odor; d_{150} 0.899 (some time after distillation).

Picea Rubens, "red spruce." Of this species also the oil from the needles and cones was examined. The yield of needle oil came to 0.204 per cent.; d_{160} 0.9539; 66.2 per cent. bornyl acetate; 7.76 per cent. free borneol. The odor of the cone oil resembled that of turpentine, the yield amounted to 0.38 per cent.; d_{150} 0.860.

Larix Americana.—The yield of the oil distilled from needles and twigs was 0.149 per cent.; d_{150} 0.8816; ester-content 15.1 per cent. (calculated for bornyl acetate). On repeated fractional distillation, a fraction could be isolated which boiled between 155° and 162° C., and in which pinene was detected (nitrosochloride, m. p. 108° [?]). The authors conclude from their examinations that the oil consists of about 15.1 per cent. esters and for the rest largely of pinene.

Pinus Rigida, "pitch pine." Twelve kilos leaves and twigs yielded only 0.2 Cc. of a yellow oil with an extraordinary pungent odor, which was not sufficient for analysis.

Pinus Resinosa, "red pine." The quantity obtained of this oil was also too small for a chemical examination; the yield only amounted to 0.001 per cent. The color of the oil was brownish-red, the odor pungent and disagreeable.—Schimmel's Rep., April, 1907, 84; from Journ. Amer. Chem. Soc., 28 (1906), 1198.

Oil from the Needles of Pinus Halepensis—Phenyl-Ethyl Alcohol a Constituent.—E. Grimal, while engaged in his work on the oil from the needles of *Pinus halepensis* Mill., of Algeria, in the laboratory of Schimmel & Co. detected the presence of phenyl-ethyl alcohol, which up to the present had only been found in neroli and rose oils. Its identity has since been established by elementary analysis, its behavior on oxidation, and the preparation of its phenyl urethane.—Schimmel's Rep., April, 1907, 84; from Compt. rend., 144 (1907), 434.

Swedish Pine-needle Oil—p-Cymol a Constituent.—Konjakow and

Schindelmeiser report, supplementary to data heretofore reported by others, that they have determined the presence of p-cymol in the volatile oil distilled from the needles of *Pinus sylvestris* in Sweden, which has not previously been reported. The other constituents of Swedish pine-needle oil are d-pinene (ortho- and pseudo-?), d-sylvestrene, dipentene, and borneol acetate. The authors have also obtained in the course of the fractionation trifling quantities of a hydrocarbon boiling at 145° C., possibly either styrol or toluol.—Pharm. Ztg., li, No. 63 (1906), 703; from Chem. Ztg., No. 59, 1906.

Oil of Pinus Pumilio—Variation Due to Natural Causes.—Schimmel & Co. call attention to the difficulty experienced during the past season to obtain oil of *Pinus pumilio* of normal quality from their old trustworthy purveyors, both in the Tyrol and in Styria. These oils differed from the normal oil by a particularly low specific gravity and high rotation. Thus, in the oil from the Tyrol, the constants fluctuated between the following limits: Sp. gr., 0.8596 to 0.8629; optical rotation, $-10^{\circ} 57'$ to $-15^{\circ} 20'$; ester content, 4 to 4.9 per cent.; solubility, in 4.5 to 6.0 and more vol. of 90 per cent. alcohol; while the constants hitherto established for the normal oil (which are practically the same as those accepted in the B. P.), show: Sp. gr., 0.865 to 0.875; optical rotation, $-4^{\circ} 30'$ to -9° ; ester content (bornyl acetate), 5 to 7 per cent. These variations from the normal are attributed by the distillers to the abnormal weather conditions prevailing during the past year; and, since these distillers are known to be reliable and any adulteration whatever is out of the question, it would seem to be necessary to revise the limits fixed.—Schimmel's Rep., October/November, 1906, 62.

Oil of Thuja Plicata—Characters and Constants.—W. C. Blasdale has distilled and examined the volatile oil of the Pacific arbor vitæ, *Thuja plicata*, and reports his results as follows: The oil obtained from the air-dry leaves was dark brown, and had a strong terpene odor. Specific gravity, 0.8997 at 15° C.; $[\alpha]_D = +1^{\circ} 45'$; n_D 1.4575, boiling-point, 150° to 225° C. The major portion of the oil distilled between 198°–200° C., and contained thujone. On distilling the shavings of the wood of the tree no oil separated; but on shaking out the aqueous distillate with petroleum-ether, separating and evaporating the solvent, a white crystalline body, melting-point, 80° C., with the characteristic odor of the wood, was obtained. To this the formula $C_{10}H_{16}O$, is provisionally attributed.—Pharm. Journ., June 1, 1907, 723; from Jour. Amer. Chem. Soc., 29 (1907), 539.

Oil of Turpentine—Constituents.—B. Ahlström and O. Aschan conclude from the results of the fractionation of American and French oils of turpentine that turpentine oil contains besides pinene, a further terpene (or perhaps more than one), which has a rotatory power opposite to that

of the pinene belonging to it, and that not even the pinene fractions proper (155° to 156° C.) consisted exclusively of pinene. The hydrochlorides of pinene produced from the two oils, pointed to the probability that it was a question of a "pseudo-pinene" according to Semmler; but the fact that the quantity of hydrochloride obtained from the higher fractions diminished considerably, whilst pseudo-pinene should give addition-products identical with those of pinene, rendered this assumption untenable. On further examination it was shown that the higher pinene fractions undoubtedly contained larger quantities of pseudo-pinene, but that this was not the only foreign constituent of the fraction. Aschan therefore assumes that possibly cymene or limonene may be present, and that the possible presence of camphene may also deserve consideration.—Schimmel's Rep., October/November, 1906, 75; from Berl. Berichte, 39 (1906), 1441.

Turpentine Oil—Products of Decomposition by Heat.—Mokievsky has made a study of the products of decomposition of turpentine oil which are formed during the heating in a sealed tube to a very high temperature. Besides gaseous products, liquid fractions of different boiling-points— 20° to 30° C., 30° to 40° C., 70° to 80° C., 96° to 110° C., and 135° to 145° C., were obtained, but a large proportion of the oil remained unaltered, and a heavy high-boiling oil was also obtained. The author identified in the first fraction: Ethylene, propylene, divinyl and various isomeric butylenes. The fraction between 30° and 40° C. consisted almost entirely of isoprene and trimethylethylene. The next fraction contained 10 per cent. of benzene, and various hydrocarbons with open chain, chiefly dimethylisopropyl ethylene; in the fractions 95° to 145° C., toluene and different xylenes were found.—Schimmel's Rep., October/November, 1906, 76; from Journ. russ. phys. Chem. Ges., 36, 913.

Swedish Turpentine Oil—Constituents and Constants.—I. Kondakow and J. Schindelmeiser communicate the following concerning the constituents and constants of Swedish oil of turpentine: The dextrogyrate oil gave a fraction of the b. p. 153° to 160° C. ($n_D + 22^{\circ} 28'$), one of the b. p. 185° to 190° C. ($n_D + 10^{\circ} 20'$), and a small residue. In addition to sylvestrene and dipentene, the oil contained a hydrocarbon of the b. p. 174° to 176° , which could not be combined with HCl, and is considered to be p-cymene, and also an unidentified hydrocarbon having the boiling-point 145° C.—Schimmel's Rep., October/November, 1906, 76; from Chem. Ztg., 30 (1906), 722.

"Philippine Wood-Oils"—Source and Description.—A. M. Clover describes under the generic designation of "Philippine wood-oils" three liquid balsams which dry very badly, and have a high content (75 per cent. and above) of volatile components, consisting chiefly of bodies of the sesquiterpene group. These several oils or balsams are known respectively

by the names of "Supa-Oil," "Apitong Oil" and "Tanao Oil," and greatly resemble copaiba and gurjun balsams.

Supa Oil is obtained from a leguminous tree, *Sindora Wallachi*, Benth, distributed throughout the Philippine islands, by tapping, the yield being about 10 liters per tree. It is a mobile, homogeneous liquid, of a faint yellow color, feebly fluorescent, and having a faint but characteristic odor; sp. gr. $\frac{3}{4}$ °, 0.9202; optical rotation at 30°C. $-31^{\circ} 3'$; separates below 20° C. white flaky crystals of a hydrocarbon (m. p. 63°–54° C.), forming about 5 per cent. of the balsam, and yields on steam distillation a colorless oil (sp. gr. $\frac{3}{4}$ °, 0.9053; $a_{D_{31}^{\circ}}$ — 21°), passing over principally between 143° and 149° C. Obtained without steam *in vacuo*, the volatile oil passes over at 40 Mm. pressure up to 170° C., but without constant boiling-point, to the amount of about 73 per cent. of the original balsam, and consisting probably of a mixture of sesquiterpenes, among which cadinene was isolated. Alcohol-like bodies were absent. The light brown semi-solid residue remaining after the distillation contained the before-mentioned hydrocarbon, probably a paraffin.

Apitong Oil (Balao), which is universally known among the natives, is derived from *Dipterocarpus grandifluus*. It resembles in its components the "supa oil," but consists chiefly of a solid resin, water and 25 to 30 per cent. of volatile oil. The maximum quantity of this balsam yielded by one tree per day amounts to about 1 kilo. In the fresh state it is white, but gradually becomes darker, and when left standing, readily dries up to a thin film; it forms no homogeneous liquid, and contains large quantities of granular substances which remain suspended. The odor of the balsam is faint but characteristic; it appears to dissolve in all the usual solvents except alcohol. On distillation, which must be over a naked flame, about 50 per cent. of distillate, consisting of oil and water in equal proportions, is obtained, the oil doubtless consisting mainly of a sesquiterpene (sp. gr. $\frac{3}{4}$ ° 0.9140; $a_{D_{30}^{\circ}}$ + 61.3°). The crude distillate has a faint yellow color and the characteristic odor of the balao.

Panao Oil (Malapaho) is the product of *Dipterocarpus vernicifluus* Blanco, and is obtained like "balao," but is not used so much as the latter, probably because it dries with much more difficulty. The fresh oil is white, viscid, has a characteristic odor, becomes darker colored on standing, and dries very slowly even in a thin film. All the samples examined contained about 25 per cent. of water, about 35 per cent. of a sesquiterpene oil (sp. gr. $\frac{3}{4}$ ° 0.9165; $a_{D_{30}^{\circ}}$ — 54°) and about 40 per cent. of solid constituents.—Schimmel's Rep., April, 1907; from Philipp. Journ. Science, 1, (1906), 191.

ALCOHOLS AND DERIVATIVES.

Alcoholic Fermentation — Question of Intermediate Products.—The investigations of Arthur Sator have demonstrated that lactic acid is not

an intermediate product in the fermentation of glucose by means of yeast to alcohol and carbon dioxide. For, in the first place, lactic acid is either not destroyed by yeast or only very slowly and incompletely, whereas if it is an intermediate product it must disappear as quickly as it is formed, or else it would be found in the solution; secondly, lactic acid when added to a fermenting liquid retards fermentation slightly instead of increasing it; and, lastly, although small quantities of lactic acid have been isolated during fermentation, this fact cannot be adduced as an argument that it is an intermediate product, and it is much more probable that it is a by-product. If an intermediate product does exist it must satisfy the following conditions: (1). It must ferment at least as quickly as, and perhaps much more quickly than, glucose; (2) it must disappear quickly when introduced into a fermenting solution; and (3) it must be difficult to isolate it from such a solution.—Chem. News, March 1, 1907, 106; from Ber. d. D. Chem. Ges., xl (1907), No. 1.

Alcohol—Effect of Combustion on Metal Parts of Lamps and Heating Apparatus.—At the recent International Congress of Applied Chemistry, R. Duchemin and H. Carrol reported a series of observations on the causes of chemical action on the metal parts of lamps and heating apparatus in which alcohol is used as fuel. They found that the quantity of acid produced by the combustion of *ethyl alcohol* is sufficient to account for the way the spirit attacks the metal, and that the temperature and the quantity of air consumed influences the proportion of acid yielded by the alcohol. The acidity resulting from burning *methyl alcohol* is slightly less than that of ethyl alcohol. *Acetone* causes comparatively little acidity.—Amer. Journ. Pharm., 1906, 432.

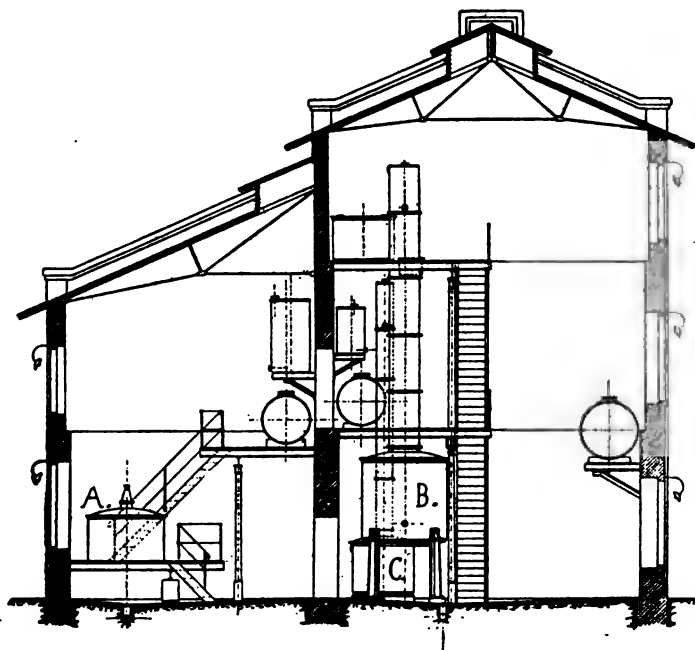
Alcohol—Presence of Zinc in Commercial Samples.—G. Guérin calls attention to the presence of zinc in alcohol, which he has repeatedly observed in commercial samples, and which is doubtless derived from the zinc-coated containers in which it has been stored. He finds that both ethyl and methyl alcohol dissolve small quantities of the metal under these conditions. The zinc may be readily determined in the residue of evaporation of such alcohol by the ordinary methods, or directly in the alcohol by a special method described by the author, dependent on the development of a characteristic green fluorescence by reflected, rose color by transmitted light, when an excess of the suspected alcohol is added to a solution of urobilin in chloroform, rendered alkaline with a few drops of ammonia.—Pharm. Ztg., lii (1907), No. 19, 192; from Journ. de Pharm. et Chim., xxv (1907), No. 3.

Denatured Alcohol—Composition.—In "Regulations No. 30, United States Internal Revenue," a pamphlet descriptive of the regulations and instructions concerning denatured alcohol, the product that will be for sale in the ordinary course of trade is defined as completely denatured

alcohol, consisting of 100 parts by volume of ethyl alcohol of the required proof, 10 parts by volume of methyl alcohol and 1 part by volume of benzin, both of the latter of approved quality. Provision is also made for the use of specially denatured alcohol by certain manufacturers, not, however, by those engaged in the manufacture of liquid medicines or beverages. —Amer. Journ. Pharm., Dec., 1906, 575.

Ether—A Modern Plant for Its Manufacture.—Although our pharmaceutical text books and commentaries give a more or less satisfactory description of the modern methods of conducting the manufacture of ether, the illustrations accompanying the text, if indeed such are at all supplied, are usually superannuated and do not afford a satisfactory picture of the process as it is now actually carried out on an industrial scale. The accompanying illustration (Fig. 43) of an up-to-date plant for the manufac-

FIG. 43.



Modern Ether Plant.

ture of ether may therefore serve to supply this deficiency ; but in this illustration the details of the apparatus employed are necessarily omitted, it being intended to give a general outline of the essential parts of the apparatus required for the generation and purification of the ether, the complicated conducting pipes, condensers, etc., being omitted to avoid confusion. Moreover, the detailed description of the several parts of the plant may be consulted in a paper contributed by Schuberg in No. 6, 1906, of the

Ztschr. f. Apparatenkunde—the system here described being that of the firm of J. L. C. Eckelt, of Berlin. This plant is capable of producing 3000 liters of ether, when in continuous operation during 24 hours, the illumination of the interior being effected by electric lights *from without*. Two ether generators are provided, so that when the one is exhausted, the other may at once be put into operation. One of these generators is shown by *A*. It is filled up to a certain height with sulphuric acid and alcohol, heated by means of steam, and when the temperature reaches 140°C ., alcohol is allowed to flow in from the reservoir situated above (to the right), the inflow being regulated by the passage of the alcohol through a device (not shown) which assures constant pressure. The crude ether, produced by the abstraction of 1 mol. of water from the alcohol by the action of the sulphuric acid (according to the equation: $2\text{C}_2\text{H}_5\text{OH} - \text{H}_2\text{O} = \text{C}_2\text{H}_5\text{OC}_2\text{H}_5$) passes through the condenser direct into a receptacle (not shown) in which it is neutralized and washed and, from time to time, drawn off into the capacious rectifying still *B*. From here it passes through a rectifying column, and finally, after drying the vapor over calcium chloride, through a condenser into a storage vessel, from which the new pure and finished ether is drawn off as required. The residue in the large rectifying still *B*, is then transferred into the small recovery apparatus *C* (shown in the drawing behind *B*), which is also surmounted by a rectifying column, and when a sufficient quantity of this residue has accumulated, the ether and undecomposed alcohol are vaporized from it and collected in suitable receptacles—the latter being added to the alcohol supply which is fed into the generator *A*. It is obvious that in conducting this process all precautions are observed to prevent loss by leakage, and it is claimed that under this system the yield reaches at least 95 per cent. of the theoretical quantity; whereas by the methods ordinarily practiced, even with the exercise of care and the use of well-constructed rectifying stills, only 80 per cent., or at most 85 per cent., of the theoretical yield is obtained.—Pharm. Ztg., lii, (1907), No. 17, 169–170.

Ether—Removal of Last Traces of Alcohol.—T. Guigues takes advantage of the affinity of the various resins for alcohol for the removal of the last traces of the latter from ether. He finds that if about 2 per cent. of rosin (colophonium) is added to ether containing 1 per cent. of alcohol, and the mixture is distilled slowly on the water-bath, the ether is obtained in form of an absolutely alcohol-free distillate, and the alcohol is retained by the melted colophonium in the still. The method avoids the tedious washing of the ether with water and the consequent loss; but is of course applicable only for the removal of alcohol, and not for the removal of other impurities.—Pharm. Ztg., li, No. 80 (1906), 886; from Journ. de Pharm. et Chim., xxiv (1906), No. 5.

Artificial Fruit Ethers—Commercial Variability.—Referring to, and

reproducing Professor Kletzinsky's table of formulas for preparing artificial fruit essences, as originally published in Dingler's Polytechnical Journal in 1867 (vol. 180, p. 77), and which has been reproduced with more or less modifications in the U. S. Dispensatory during the past 35 years, Willard Graham points out the difficulties confronting the wholesaler in supplying the artificial fruit ethers of the quality demanded in these formulas, since there are no two manufacturers that list their goods in the same way, or at the same price. During the past few years he has examined many samples of fruit ethers, and from the results obtained he feels justified in saying that in no other class of preparations do such wide variations take place as regards quality and price. The ethers that came under examination were the following: Amyl acetate (so-called "pear oil"); amyl butyrate; amyl valerate (so-called "apple oil"); ethyl acetate; ethyl benzoate; ethyl butyrate; ethyl formate; ethyl cœnanthate; ethyl pelargonate; ethyl sebacate; ethyl valerate, and ethyl aldehyde. Although from three to five samples are represented under each heading, the figures given show that no two samples accurately corresponded to each other, nor to the normal constants that have been established for them. What this means when the attempt is made to prepare artificial fruit essences by Kletzinsky's or any other formula, may readily be conjectured.—Proc. Penna. Pharm. Assoc., 1906, 171-175.

Chloroform—Detection of Hydrochloric Acid.—Breteau and Woog find Congo-red a delicate reagent for the detection of hydrochloric acid in chloroform, being available when silver nitrate fails. The reagent is best applied by floating sections of elder pith, colored with it, upon the surface of the chloroform.—Pharm. Ztg., lii (1907), No. 45, 468; from Rép. de Pharm., 1907, No. 2. •

Chloroform and Iodoform—Decomposition by Vegetable Oils.—S. F. Popow, in continuation of previous investigations, has demonstrated that both iodoform and chloroform are liable to be decomposed in contact with vegetable fats under the influence of heat, air and light. The observation is particularly important in its connection with chloroform because of the use of the latter in the determination of the iodine number of fats by Hübl's method. The instability of iodoform and chloroform under the influence of temperature and air was demonstrated by heating their mixtures with linseed oil (with iodoform to 110° C., with chloroform to boiling), simultaneously passing air, freed from CO₂, through the mixtures, and then through silver nitrate, lime water and ammoniacal silver solution, to collect the products of decomposition according to the method of Berthelot. In the case of iodoform a distinct decomposition to CO₂, with traces of CO, resulted, whilst chloroform yielded mere traces of CO₂, but very much more CO. When mixtures of linseed oil and theobroma oil with chloroform and iodoform were exposed to light the iodine number of

theobroma oil was reduced from 35.7 to 32; that of linseed oil was reduced from 170 to 145 in the presence of chloroform, and with iodoform from 170 to 118.—Pharm. Ztg., lii (1907), No. 23, 235; from Journ. d. russ. phys.-chem. Ges., 1906, 1115.

Chloral Hydrate—New and Characteristic Reactions.—Dr. Ereole Covelli-Catronei states that the reactions already known for the recognition of chloral hydrate are inconclusive. That now proposed by the author is characteristic of chloral, no similar reaction being given by any other substance. It depends upon the property of chloral to form a greenish-blue substance with fatty oils in presence of a dehydrating agent, such as P_2O_5 , H_2SO_4 , $SbCl_3$ or $ZnCl_2$. One mil. of castor oil is warmed for ten minutes on a water-bath in a porcelain dish, and in the middle of the oil is placed a piece of antimony trichloride about the size of a pea; this forms an orange-yellow resinous mass. On now placing a trace of chloral hydrate on this resinous mass while the dish still remains on the water-bath there results a small colored spot, and later a beautiful deep bluish-green coloration. The chloral hydrate may also be dissolved in the castor oil on the water-bath, and the antimony trichloride added. In this case there forms in five to fifteen minutes a ring round the antimony salt of the same blue-green coloration. The second method is recommended for the recognition of chloral hydrate in aqueous solution. On shaking such a solution with an equal quantity of ether, the chloral is taken out by the ether. To this ethereal solution is added 1 to 2 mils. of castor oil, the ether driven off on a water-bath in a porcelain dish, and the residue dried in a desiccator over sulphuric acid. With this dried product, which contains the chloral, the reaction may be obtained in the manner described above.—Pharm. Journ., April 6, 1907, 433; from Chem. Ztg., March 30, 1907.

Methyl Alcohol—New Method for its Detection in Ethyl Alcohol.—E. Voisenet recommends a new method for the detection of methyl alcohol, which is based on a characteristic color-reaction (violet) of formaldehyde with nitrous acid in the presence of egg-albumen. This reaction, first observed by the author, is also obtained with the oxidation products, methylal and methylenediethylate, obtained with chromic acid from methyl alcohol, while the oxidation-products of ethyl alcohol only produce a yellow color. To carry out the test, a quantity of the suspected alcohol corresponding to 10 Cc. of absolute alcohol is diluted with water to 50 Cc., 5 Gm. of potassium dichromate and 30 Cc. of diluted sulphuric acid (20 per cent. by weight) are added, shaken until the dichromate is dissolved, and allowed to stand at the ordinary temperature one hour. The mixture is then slowly distilled, the first 30 Cc. of distillate, containing all the acetaldehyde formed, being rejected, and the next 20 Cc., containing all the methylal, being then subjected to the above-mentioned test as follows: Place 4 Cc. of this second distillate and 1 Cc. of 10 per cent. albumen

solution (prepared from a fresh egg-white with $\frac{1}{2}$ its volume of distilled water and 15 Cc. of a strong nitrite solution in HCl) in a test-tube, and expose this to a temperature of 50° C. in a water-bath. In the presence of methylal a violet color is produced, the maximum intensity of which is reached with a content corresponding to 2 per cent. of methyl alcohol. A blank experiment should be made for the purpose of comparison. The reaction is recognized in dilutions of 1 : 20,000. The proportions mentioned apply to a methyl alcohol content of 0.1 to 10 per cent.; if these are exceeded, the dilution of the volume of alcohol corresponding to 10 Cc. of absolute alcohol must be increased to 100 Cc.; if less, it is to be reduced to 25 Cc., and correspondingly larger or smaller fractions of distillate obtained.—Pharm. Ztg., li, No. 89 (1906), 986; from Chem. C.—Bl., 1906, ii, No. 16.

Formaldehyde and Other Aldehydes—A New Reagent.—E. Feder describes a new mercuric solution which serves as an excellent and expeditious reagent for formaldehyde, as well as aldehydes in general. This reagent is prepared by mixing equal volumes of a 2 per cent. aqueous solution of mercuric chloride and of a solution of 100 Gm. sodium sulphite and 80 Gm. sodium hydroxide in 1000 Cc. of water—the latter being rapidly added to the mercuric solution with rotation. This clear, colorless solution is instantly decomposed on addition of formaldehyde, metallic mercury being deposited. It is available for the detection of as little as 0.05 Mgm. of formaldehyde. Other aldehydes, as well as glucose, may be determined with the same reagent with equal facility and certainty.—Arch. d. Pharm., 245 (1907), No. 1, 25.

Formaldehyde—Use as a Gaseous Disinfectant.—Professor Daniel Base interestingly reviews the history of formaldehyde, particularly in the direction of its utility as a gaseous disinfectant. He says that although this gas is not a perfect disinfectant, it is the nearest approach we have to it, and that while experimental investigations of its efficacy are still being carried on in numerous laboratories there is no doubt that formaldehyde plays an important role in disinfection of houses at the present day. It penetrates corners and crevices, does not injure objects or persons, and its unpleasant odor can be removed by injecting ammonia gas into the rooms. It appears, however, to be more particularly suited as a surface disinfectant, since germs covered up by several folds of cloth, paper, or similar material, are not easily reached during the gas disinfection—Discovered in 1867, the disinfecting power of its solution was first observed in 1888 by Loew and Trillat, and in the following year, Buckner and Segale showed that the gas has much greater power than its aqueous solution. The question of how to liberate the gas from its solution, or direct from methyl alcohol, has since engaged the attention of investigators, it being a desideratum in disinfection work to liberate a large quantity of formaldehyde

gas in a short space of time. The method of obtaining it directly from methyl alcohol by means of the so-called methyl alcohol lamp, has been found unsatisfactory for this purpose, the more particularly since the aqueous solution, commonly called "Formalin," is now cheaply available, being manufactured in enormous quantities. The author discusses the various methods that have been proposed from time to time for utilizing formalin for the gaseous disinfection of rooms; but with the exception of the evaporation of formalin at ordinary temperatures, the methods of obtaining formaldehyde gas from its aqueous solution, involved the use of expensive and sometimes inconveniently heavy apparatus, and the application of flame, whilst none of them is the formaldehyde completely utilized. The one method that commends itself on account of its simplicity and the inexpensive apparatus required, is the so-called

Permanganate-Formalin Method, which was proposed in 1904 by Henry D. Evans and Dr. J. P. Russell, of the Laboratory of Hygiene, Augusta, Maine, and consists of pouring formalin upon fine crystals of potassium permanganate contained in a metallic pail. It is a case of destroying a part of the formaldehyde in order to liberate another part, the permanganate in oxidizing a part of the formalin producing a great amount of heat, sufficient to evaporate nearly all of the liquid. The best proportions to use are 100 Cc. of formalin (which contains approximately 37 per cent. of formaldehyde) and 50 Gm. of permanganate, resulting in the destruction of from 61 to 62 per cent. of the formaldehyde, while about 38 to 39 per cent. are given off unchanged as gas. The experiments of G. Werner have shown that "in all cases an average of 0.1416 Gm. of formaldehyde per cubic foot of space should be present with 7 hours' action," while Flugge considers one-half that quantity (0.071 Gm. per cubic foot) sufficient. The latter quantity is secured for 1000 cubic feet of space with 520 Cc. of formalin of 36 per cent. The apparent wastefulness of this method is compensated by the greater convenience, the more particularly when it is considered that by the methods depending on the vaporization of the formaldehyde from its solutions, either simply from metallic retorts or under a pressure of 3 or 4 atmospheres from the autoclave, the loss by polymerization amounts to from 50 to 60 per cent.—Proc. Maryland Pharm. Assoc., 1906, 45-49.

Tetramethylarsonium Iodide—Preparation and Characters.—V. Bürgi prepares tetramethylarsonium iodide, $(\text{CH}_3)_4\text{AsI}$, as follows: One part of arsenic is heated with 4 parts of methyl iodide in a sealed tube at 220 C. for forty-eight hours, which results in the formation of the double compound $\text{As}(\text{CH}_3)_4\text{I} + \text{AsI}_3$. The product of the reaction is extracted with hot alcohol, which on concentration yields long, greenish needle-shaped crystals. These after purification, are boiled with soda solution until the gray-white compound formed is melted, when the mixture is allowed to

cool and transferred to an asbestos filter. The residue on the filter is dissolved in hot water, filtered, treated for some time with carbonic acid, again filtered, and evaporated. The residue is then extracted repeatedly with hot alcohol, and the alcoholic solution concentrated to crystallization. The tetramethylarsonium iodide is recrystallized repeatedly from hot methyl alcohol and finally dried. It forms handsome colorless tetrahedrons, which slowly turn red-brown on exposure to light, and are readily soluble in water, difficultly in alcohol, and insoluble in ether or chloroform. Physiologically, the compound acts as a central paralyzant, similar to curare, but does not manifest any arsenical action, since it passes almost completely, unchanged into the urine.—Pharm. Ztg., li, No. 98 (1906), 1083; from Arch. f. Exper. Pathol. u. Pharm., 56, Nos. 1 and 2 (1906).

Sulphonal—Detection in Trional and Tetronal.—E. Gambutti observes that since sulphonal is much cheaper than either trional or tetronal it suggests itself as a probable adulterant of those hypnotics. Such admixtures may, however, readily be detected by taking advantage of the markedly lower solubility of sulphonal in ether. Thus 1 part of sulphonal requires 133 parts of ether for its complete solution at 15° C., trional requires 15.57 parts, and tetronal 9.83 parts. 10 Cc. of ether at 15° C. will, therefore, completely dissolve 0.5 Gm. of trional, 1 Gm. of tetronal, and only 0.07 Gm. of sulphonal. The insoluble residue, washed with a little ether, may then be readily tested for sulphonal by the usual reagents and identified by its melting-point, 125.5° C. The crystalline form of the residue obtained by allowing a drop of the ethereal solution to evaporate on a micro-slide is also characteristic when examined under a lens. The crystals of sulphonal are fern-leaf like and denticulated, like those of magnesium ammonio phosphate. Trional crystals are rectangular tablets, and tetronal forms almost round fibrous-rayed emarginate discs, similar to the crystals of urea-oxalate.—Pharm. Journ., June 15, 1907, 779; from Journ. de Phar. et Chim., 25 (1907), 483.

Resorcin—Convenient Reaction for Traces.—A. Carobbio recommends the following simple method for detecting traces of resorcin: Zinc chloride is mixed with ammonia water until a clear solution is effected, and to 1 Cc. of this reagent, in a test tube, a solution of the suspected substance in ether is added. In the presence of traces of resorcin a yellowish ring is developed at the contact zone of the two liquids, which changes rapidly to green, dark blue, and within a few minutes to an intense blue. Aluminum chloride may be used in place of zinc chloride to produce the reagent, but the reaction is less prompt and distinct. Hydroquinone under the same conditions produces a yellow ring with the zinc-ammonia reagent, which changes soon to brown-red; whilst pyrocatechin produces an immediate garnet-red ring.—Pharm. Ztg., li, No. 69 (1906), 767; from Boll. Chim. Farm., 1906, No. 10.

Phenol—Liquefaction.—To liquefy phenol expeditiously, E. L. Cheeseman recommends the addition of the requisite amount of water *previous* to heating. Instead of a water-bath, use an ordinary asbestos stove mat, or, what is better yet, a heavy sheet of asbestos board one-fourth inch thick.—Bull. Pharm., April, 1907, 164.

Phenol—Liquefaction Without Heat.—W. R. Cobb recommends instead of applying heat to the containers of phenol, to add the necessary quantity of water—1 oz. to the pound of crystals in the bottle; then set the bottle on its side, or invert it. In less than 24 hours the acid will be completely liquefied.—Bull. Pharm., June, 1907, 249.

Cresol—Characterization.—In view of the use of cresol as a solvent for morphine in opium assays, recently proposed by Mr. Tickle (which see under "Opium"), Alexander Gunn observes that the term "cresol" as used by Mr. Tickle refers to the mixture of phenolic homologues represented by crude carbolic acid of the better qualities, such as Calvert's No. 5, although in reality he would use meta-cresol but for the cost. But cresol, commercially, means a mixture of the three isomeric cresols (ortho-, meta-, and para-), or hydroxyl derivatives of toluene, variously called cresylic acid, cresyl hydrate, methyl phenol, methylhydroxyl-benzene, etc. It occurs in coal tar or the tar obtained by the destructive distillation of beech or pine wood. But it may be obtained in a pure state by acting on toluene with sulphuric acid and heating the resulting sulphonic acid with potash. Meta-cresol may be obtained synthetically by heating 100 Gm. of thymol with 35 Gm. of phosphorus pentoxide for ten or twelve hours, the propylene which is evolved being passed into bromine in order to obtain its bromide as a by-product. The syrupy mass is brought into 115–120 Gm. of fused potassium hydroxide, and the mixture kept in a state of fusion and well agitated for five or ten minutes. It is then dissolved in water and extracted with ether in order to remove cresyl phosphate and other substances; the residue is then decomposed with hydrochloric acid, the meta-cresol taken up with ether, the latter distilled off, and the product purified by distillation in a current of carbon dioxide. Cresol resembles phenol very closely, but the odor, though similar, is not so pleasant as that of phenol. It bears the same relation to toluene as phenol does to benzene.—Pharm. Journ., March 2, 1907, 261.

Cresol—Precaution in U. S. P. Test for Phenol.—Charles E. Vanderkleed directs attention to the importance of using the exact quantity of glycerin (1 Cc.) in making the official test for the presence of phenol in cresol. A mere trace of glycerin in excess will prevent the complete separation of the cresol, even though this be absolutely pure. He therefore recommends the use of larger quantities—5 Cc. each of cresol, glycerin and water—to facilitate accuracy in measurement. At best, however, the test is not of great delicacy, since, according to F. E. Dodge, as

much as 10 per cent. of phenol may be added to pure cresol without being detected by it.—Proc. Penna. Pharm. Assoc., 1906, 133.

Cresolum Crudum, G. P.—*Proposed Characterization.*—Dr. J. Herzog proposes the following characterization of crude cresol for the new German Pharmacopœia, which assures a preponderance of *meta-cresol*—the most valuable bactericidal constituent—with some *para-cresol*, but excludes the inactive *ortho-cresol*: A clear, yellowish to yellowish-brown, neutral fluid, freely soluble in alcohol and ether, sparingly soluble in water, but forming a clear solution in 100 parts; b. p. 198° – 202° C. If 10 Cc. of cresol, 50 Cc. of solution of sodium hydrate and 50 Cc. of water are mixed in a graduated cylinder, complete solution, showing at most faint opalescence, should result, and no flocculent precipitate develop within 24 hours; on then adding 30 Cc. of hydrochloric acid and 10 Gm. of sodium chloride, and shaking the mixture, an oily layer of 9 to 9.5 Cc. of cresols should separate on standing. On dissolving 0.5 Cc. of the separated cresols in 300 Cc. of water and adding 0.5 Cc. solution of ferric chloride a blue-violet color is developed. These tests exclude also the presence of hydrocarbons (naphthalin), pyridine bases, and other impurities.—Apoth. Ztg., xxii (1907), No. 3, 77.

Cresolum Crudum, G. P.—*Proposed Characterization.*—H. Emde proposes that *cresolum crudum, G. P.*, shall be characterized as being a mixture of 60 per cent. of *meta-cresol* and 35 per cent. of *para-cresol*, with the remaining 5 per cent. to consist of moisture, neutral oils, pyridine, naphthalin, etc.; that 96 per cent. should distil between 199° and 204° C.; and that the *meta-cresol* content be determined quantitatively as trinitro-*meta-cresol* by the method of Raschig. Crude cresol of this quality is now on the market and is only one-half more expensive than the article official in the G. P. IV.—Apoth. Ztg., xxii (1907), No. 11, 104.

Phenyl-Ethyl Alcohol—*Production from the Volatile Oil of Pinus Halapensis Needles.*—E. Grimal has obtained from the needle oil of *Pinus Halapensis* a fraction at 120° – 135° C., under 10 Mm. pressure, which was saponified, and the product again fractionated at 95° to 98° C., under 8 Mm. This product formed a phthalic acid ester, which, when saponified, gave phenyl ethyl alcohol, $C_8H_{10}O$; boiling-point, 218° to 220° C.; specific gravity, 1.0187 at 15° C.; n_{D18} 1.52673; optically inactive. In reactions and compounds it agreed precisely with synthetic phenyl ethyl alcohol, the phenyl urethane, $C_{15}H_{15}O_2N$, of both having the identical melting-point, 79° – 80° C.—Pharm. Journ., April 6, 1907, 433; from Compt. rend., 144 (1907) 434.

Phenolphthalein—*Value as a Purgative.*—In contradiction to the experience of Holz that the use of phenolphthalein as a purgative is attended by unpleasant irritant action in the intestines, G. Brasch speaks commendably of this remedy and recommends its introduction and use in

medicine under its own name. He regards phenolphthalein as being of particular value in acute and chronic constipation, and finds that its use in the doses of 0.05 to 0.1 Gm. for children, 0.1 to 0.2 Gm. for adults, and of 0.3 to 0.5 Gm. in stubborn cases, is quite efficient and unattended by any unpleasant side-effects.—Pharm. Ztg., li, No. 60 (1906), 668; from Ztschr. f. Med.-Beamte, No. 14, 1906.

Phenolphthalein—Caution Against Excessive Doses.—The use of phenolphthalein as a purgative is not unaccompanied by dangerous by-effects; but this is regarded by Best to be due to excessive doses. While single doses of 0.5 Gm. phenolphthalein may manifest violent poisonous action, smaller doses, up to 0.2 Gm. have proven comparatively harmless.—Pharm. Ztg., li, No. 97 (1906), 1074; from Ztschr. f. Med.-Beamte, No. 82, 1906.

Glycerin—Solvent Power.—A. M. Ossendowski has determined the solvent action of pure glycerin—sp. gr. 1.256 at 15° C., boiling-point 284° C.—carefully prepared by himself from bean oil, on a variety of substances, and reports the results as follows:

100 parts of Glycerin dissolves at 15°–15.6° C.:

Ammonium carbonate.....	20.00	Sodium arsenite.....	50.00
Ammonium chloride.....	20.06	Sodium bicarbonate	8.06
Barium chloride.....	9.73	Calcium sulphide.....	5.17
Borax.....	60.00	Copper carbonate.....	10.00
Boric acid.....	11.00	Copper sulphate.....	30.30
Benzoic acid	10.21	Tannin	48.83
Iodine.....	2.00	Mercuric chloride	8.00
Potassium arsenate.....	50.13	Zinc chloride	49.87
Potassium iodide.....	39.72	Zinc iodide	39.78
Potassium cyanide.....	31.84	Zinc sulphate.....	35.18
Potassium chloride.....	3.72	Sulphur	0.14
Potassium chlorate.....	3.54	Phosphorus	0.25
Potassium auro-cyanide (KAuCy ₂)..	0.68	Oxalic acid.....	15.10
Potass. auro-cyan. (KAuCy ₂ 5Aq)...	0.21	Quinine	0.47
Sodium carbonate.....	98.30		

The several compounds were carefully purified by crystallization or distillation and responded to all requirements laid down by Landolt and Börnstein.—Pharm. Ztg., lii, (1907), No. 17, 169; from Journ. der. russ. phys.-chem. Ges., 1906, 1071.

FIXED OILS.

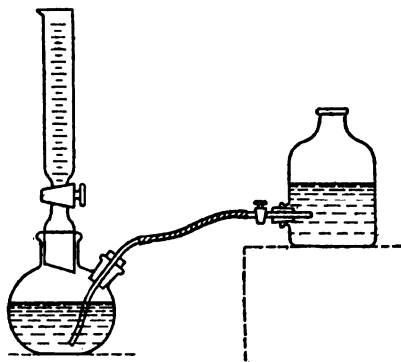
Fixed Oils and Fats—Determination of Saponification Number.—J. Davidsohn gives preference to double-normal solution of potassium hydroxide in place of the alcoholic solution commonly employed for determining the saponification number of fixed oils and fats, the saponification being completed in 15 minutes when conducted as follows: 1 to 2 Gm. of the fat, dissolved in a little ether, and 10 Cc. of double-normal solution of KOH are mixed, warmed and shaken together; then 25 Cc. of absolute

alcohol are added, and the mixture is boiled slowly under a reflux condenser, with rotation, for about 15 minutes. The clear solution is finally titrated with normal hydrochloric acid, using phenolphthalein as indicator, in the usual manner.—Pharm. Ztg., li, No. 90 (1906) 997; from Seifensticker-Ztg., 1906, 770.

Vegetable Oils—Welman's Reaction Not Characteristic.—The green coloration yielded by vegetable oils when shaken with Welman's reagent (10 Gm. phosphomolybdate of soda, 20 Cc. nitric acid, specific gravity, 1.153, and water to 100 Cc.) has been the subject of investigation by Ch. Arragon, from which it appears that in addition to vegetable oils some animal oils afford a similar coloration. This coloration is due to a constituent of the oils which is present in varying proportion, and can easily be destroyed by simple exposure to light and air, or by heating over a naked flame, or by treatment with nitric acid. Cotton-seed oil, shaken with an equal volume of fuming hydrochloric acid, no longer reacts with Halphen's solution, but is still sensitive to Welman's, and, *vice versa*, the same oil treated with nitric acid becomes inactive with Welman's reagent, but remains sensitive to Halphen's. Oleomargarin and tallow give the reaction, so that Welman's reagent is useless for detecting vegetable oils in those substances. On the other hand, it is very useful as a preliminary test for lard. It must, however, always be remembered that a negative result does not necessarily prove the absence of vegetable oils, since these may be rendered inactive by the treatment above indicated.—Pharm. Journ., Jan. 12, 1907, 28; from Ztschr. f. Unters. d. Nahr. u. Genussm., 12, 449.

Fatty Acids—Simple Method and Apparatus for their Determination in

FIG. 44



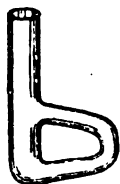
Apparatus for Determination of Fatty Acids.

Soaps, etc.—A. Goske recommends the simple apparatus shown by Fig. 44 for the convenient determination of fatty acids in soaps, wash-powders,

etc. It consists of a 250-Cc. flask surmounted by a stoppered burette of 30 Cc. capacity (graduated into $\frac{1}{10}$ Cc.), which is accurately ground and fitted into the neck. Through a tubulure in the side of the flask a bent glass tube, reaching to the bottom, is connected by means of a rubber tube with the nozzle of a pressure-flask, which is also provided with a ground glass stop-cock. In use, a weighed quantity of the soap or powder is dissolved in water in the flask with the aid of a water-bath; diluted hydrochloric acid is added to liberate the fatty acids, and the heating is continued in the water-bath for several hours, until the lower liquid becomes clear. Then, after cooling, 30 Cc. of ether are allowed to flow into the flask through the burette, the connection is made with the pressure-flask, and when the fatty acids are dissolved in the ether this is returned into the burette by opening the respective stop-cocks, so regulating the inflow that a few cubic centimeters of the aqueous layer may also enter the burette, whereupon both cocks are again closed. The position of the flasks is then reversed, the pressure-flask being below, that with the burette above. The burette is then carefully lifted, some of the liquid is allowed to flow back into the pressure-flask, and after allowing the aqueous layer in the burette to return into the flask the ether solution is transferred to a weighing-flask. A fresh quantity of ether is then introduced through the burette, to rinse out any remaining fatty acid, and the process repeated as before. The united ether solutions are then evaporated on a water-bath and the residual fatty acids are dried and weighed.—Pharm. Ztg., lii (1907), No. 37, 385; from Ztschr. f. Unters. d. Nahrungs., 1907, No. 8.

Melting Point—New Form of Apparatus for Determinations.—J. Thiele describes a new form of apparatus for determining melting points, which is shown by Fig. 45. It consists of a tube 12 Cm. long and 2 Cm. in

FIG. 45.



For Determining
Melting Points.

diameter, in one side of which a tube in the form of a loop is sealed so as to connect the bottom and middle of the main tube. In use the thermometer container is fixed at a point midway between the two limbs of the loop, and the tube filled with just sufficient sulphuric acid to cover the upper opening of the loop. The heat is applied to the loop, whereby the sulphuric acid is caused to circulate better than in the forms of apparatus ordinarily employed, and which thus causes a uniform rise in the thermometer. This apparatus is said to operate much more uniformly than others, is rapidly heated, cools off very quickly, and is not any more fragile than the apparatus ordinarily employed in such determinations.—Merck's Rep., June, 1907, 172; from Chem.-Ztg. Report, xxxi, 173.

"Almond Oil"—Production from Apricot Kernels.—Some idea of the extent of the substitution of apricot kernels for almonds in the production

of the almond oil of commerce is gained from a review of the Syrian market of apricot kernels in Schimmel's Report for April, 1907. Although the estimated crop of these kernels, 20,000 bales, may be somewhat exaggerated, the actual shipments from Syria up to the end of 1906 amounted to from 10,500 to 11,000 bales, and the purchase price advanced from 54 marks per cwt. in the beginning to 63-67 and, finally to 74 and 75.5 marks. In this connection it is of interest to note that some oil recently pressed from *sweet* apricot kernels (*i. e.*, free from prussic acid) proved to be identical in all respects with the oil pressed from ordinary apricot kernels, showing also identical distinction from true almond oil when the elaidin test is applied. The yield was from 36 to 37 per cent. of oil.—Schimmel's Rep., April, 1907, 10-11.

Caucasian Castor Oil—Constants.—According to O. Liebreich Caucasian ricinus oil exhibits marked variations in its constants from the Italian (or French) oils usually found in the German market. It is light straw-yellow in color, clear, and miscible in all proportions with absolute alcohol and glacial acetic acid; sp. gr. at 17.5° C., 0.9632; iodine number, 84.3 (Ital., 86.05); saponification number, 173.7 (Ital., 173.4); acid number, 3.6 (Ital., 7.3). The fatty acids give iodine number, 87.9 (Ital., 90.15); congealing point, 2.85° C. (Ital., 2.57°); average molecular weight, 311 (Ital., 303); the resin test (shaking 8 Cc. with 3 Cc. CS_2 and 1 Cc. H_2SO_4) gives a brown-orange color (Ital., yellow-red.)—Pharm. Ztg., li, No. 82 (1906), 908; from Therap. Monatsh., 1906, No. 9.

Oil of M'Poga Oleosa—Constants.—The chemists of the "Imperial Institute" have examined the seeds of the plant known in West Africa as "Inoy," and found them to yield 60.8, per cent. of a pale yellow oil with the following constants: Specific gravity at 15° C., 0.896; saponification value, 184.49 Mg. of potash required for 1 Gm. of oil, iodine value, 89.75 per cent.; Hehner value, 93.00; Reichert-Meissl value, 1.45 Cc. of decinormal potash required to neutralize the volatile acid from 5 Gm. of oil; acid value, 5.2 to 7.8 Cc. of decinormal potash required for 1 Gm. of oil. The cake left after expression of the oil contains 41.51 per cent. of proteids, 40.74 per cent. of carbohydrates, and 8.75 per cent. of ash, which affords 49.1 per cent. of phosphoric acid (expressed as P_2O_5) in the form of phosphates, and is expected to form a nutritious cake for feeding cattle.—Pharm. Journ., Jan. 12, 1907, 27; from Bull. Imp. Inst., iv, 200.

CARBOHYDRATES.

Cocoa Carbohydrates—Determination and Characterization.—A. D. Maurenbrecher and B. Tollens observe that in spite of the numerous investigations which have been carried out on cocoa, comparatively little attention has been paid to the characterization of the various carbohydrates which it contains. The authors hydrolyzed cocoa powder by boiling it with 4 per cent. sulphuric acid, having previously removed the fats by ex-

traction with ether. After neutralizing the acid by means of calcium carbonate, the filtered solution was evaporated, and the residue treated with alcohol to remove magnesium salts and gums. The syrupy residue so obtained deposited crystals of theobromine, and also small quantities of magnesium formate and lactate; the filtrate from these substances was then taken up with water and alcohol, and treated successively with diphenylhydrazine, methylphenylhydrazine, and phenylhydrazine; by this means the authors were able to precipitate out and identify the crystalline hydrazones of *l*-arabinose and *d*-galactose, as well as the osazone of glucose. Cocoa powder, moreover, on distillation with hydrochloric acid, sp. gr. 1.06, yielded furfural which on estimation by means of phloroglucinol, corresponded to 5.51 per cent. of pentosane in the beans freed from fat, or 2.25 per cent. on the unextracted beans. Cocoa husks treated in the same way were found to contain *l*-arabinose, *d*-galactose, glucose, and possibly xylose, as well as 9.02 to 9.09 per cent. pentosane. Cocoa-butter, when shaken with alcohol at 50°–60° C., yielded an extract which was hydrolyzed by means of alcoholic potassium hydroxide. On extracting the product with ether a crystalline solid was obtained which, after recrystallizing from alcohol, melted at 137° C. This substance appears to be phytosterol, but the authors were unable to state definitely whether it contained any cholesterol. The authors have also extended their investigations to the

Carbohydrates of Tea. For this purpose the residue obtained on evaporation of an aqueous extract of Java tea (*Thea assamica*) was hydrolyzed by means of 6 per cent. sulphuric acid. On treating the product in the same way as described for cocoa, they were able to identify arabinose, *d*-galactose, and glucose. Distillation with hydrochloric acid yielded an amount of furfural corresponding to 5.6 per cent. of pentosane.—Pharm. Journ., Jan. 5, 1907, 9; from *Berichte*, 1906, 39, 3576–3582.

Lichen-Carbohydrates—Investigation.—Mander and Tollens publish the results of their studies and investigations on the carbohydrates of the lichens. These may be broadly divided into two groups—the Iceland-moss group, and the Reindeer-moss group. The Iceland-moss group contains carbohydrates soluble in boiling water, namely: inactive *lichenin* and the strongly dextro-rotatory *evernin*. The residue after treatment with boiling water is composed of easily hydrolizable carbohydrates, which form glucose, together with some mannose and galactose. The Reindeer-moss group contains no lichenin, and the carbohydrates are hydrolizable only with difficulty, yielding primarily *d*-mannose and *d*-galactose and very little glucose. Both groups contain pentoses and methyl-pentoses. The residue after hydrolysis is apparently composed of cellulose or an analogous substance.—Pharm. Ztg., li, No. 68, 758; from *Journ. de Pharm. et. Chim.*, Aug., 1906.

Ligno-Celluloses—Para-Nitraniline a New Color Reagent.—According to A. S. Wheeler, a solution of 2 Gm. of *p*-nitraniline in 100 Cc. of hydrochloric acid, specific gravity 1.06, when warmed and dropped on to a lignocellulose produces at once a blood-red color. The reagent may be used for detecting lignocellulose in wood, jute or paper, and retains its efficiency longer than the solution of phloroglucinol in hydrochloric acid, which is ordinarily employed.—Pharm. Journ., June 15, 1907, 779; from *Berichte*, 40 (1907), 1888.

Soluble Gun-Cottons—Classification According to their Solubility Misleading.—The "Scientific American Supplement," after a description of the manufacture of "explosive" gun-cotton, mentions that "soluble" gun-cotton is made on the same lines, except that greater attention has to be paid to the physical condition of the cotton used, and to the temperature and strength of acid mixture, etc. The term "soluble" usually implies that the gun-cotton is dissolved by a mixture of ethyl-ether and ethyl-alcohol, two parts of the former to one of the latter being the proportions which yield the best solvent action. The classification of nitro-celluloses according to their solubility in ether-alcohol is misleading, except when the nitrogen contents are also quoted. The number of solvents for gun-cotton which have at various times been proposed is very large. Among the more important may be mentioned the following: Alcohols (used chiefly in conjunction with other solvents), methyl, ethyl, propyl and amyl nitro, amyl ether, acetic ether, diethyl ketone, methyl ketone, amyl nitrate and acetate, nitro-benzol, nitro-toluol, nitrated oils, glacial acetic acid, can all be dissolved in alcohol, etc. Some of the above may be called selective solvents, *i. e.*, they dissolve one particular variety of gun-cotton better than others, so that solubility in any given solvent must not be used to indicate solubility in another. No nitro-cotton is entirely soluble in any solvent. The solution, after standing some time, always deposits a small amount of insoluble matter. Therefore, in making collodion solutions, care should be taken to place the bottles containing same in a place free from vibration and shock. After standing a few weeks the clear supernatant liquid may then be decanted off.—Nat. Drugg., May, 1907, 163.

Collodion Cotton—Preparation.—G. Lunge has studied the conditions under which collodion cotton can be uniformly and with certainty obtained satisfactorily, both as regards yield and solubility in a mixture of 2 vols. ether and 1 vol. alcohol, which, as has been frequently pointed out, is not attainable when the process of the G. P. is followed. It is well known that the successful nitration of the cotton depends on the proportions, concentration, and temperature of the acid, to which must be added the quality of the acids and of the cotton, the proportions of these to each other, and the time of contact. Using cotton which has been previously treated with 2 per cent. of solution of soda, well washed and dried, 1 part of this is used to 73–74 parts of an acid mixture composed of equal parts

of sulphuric and nitric acids and containing 15.5 to 17 per cent. of water. For this purpose the crude nitric acid of the G. P. will not answer, an acid containing at least 85 to 86 per cent. HNO_3 being required. Such an acid has the sp. gr. 1.480. If 48 parts of this acid is mixed with 43 parts of crude sulphuric acid, which contains 98 per cent. H_2SO_4 , a liquid is obtained composed of about 51.3 per cent. HNO_3 , 42.2 per cent. H_2SO_4 , and 8.5 per cent. H_2O . To this mixture sufficient water must then be added to bring its percentage up to the required 15-17 per cent. It is a necessary condition also that the nitric acid used shall not contain more than 1 per cent. of hyponitric acid (N_2O_4). If then the cotton is subjected to the action of this mixture, the nitrification is completed in from 20 minutes to 8 hours, according to the temperature employed for the reaction. At 20°C ., 8 hours are required, at 40° , two hours are sufficient, while at 20° the same result is obtained in 20 minutes. The yield is about 165 per cent., the solubility of the cotton 100 per cent.—Pharm. Ztg., lii, No. 1 (1907), 8; from Ztschr. f. angew. Chem., 1906, No. 50.

Starch Grains—Structure.—Prof. Henry Kraemer has inaugurated the reprinting of a series of papers on the structure of the starch grain, originally published in the "Botanical Gazette" (xxxiv, Nov., 1902), in compliance with inquiries and requests from those interested in the practical as well as scientific side of the subject. The first paper may be consulted in Amer. Journ. Pharm., May, 1907, 217-229.

Sugars—Metadinitrobenzene as a Reagent.—Chavassieu and Morel recommend metadinitrobenzene as an efficient test for the detection and differentiation of sugars. The reagent is prepared by dissolving 1 Gm. of the dinitrobenzene in 100 Cc. of alcohol and adding 35 Cc. of a 33 per cent. solution of caustic soda. A rose-colored liquid is obtained, the tint of which does not affect that produced in the following tests, which are carried out by adding 10 Cc. of the reagent to 20 Cc. of a 1 per cent. solution of the sugar to be examined: *Saccharose* and *glycogen* give no reaction in twenty-four hours. *Maltose* and *lactose*, *dextrose*, *galactose*, and *arabinose*, a violet color in fifteen minutes. *Levulose*, an intense violet reaction in two minutes. With solutions of the above carbohydrates, 1 : 1,000, the violet color is not produced for two hours and a half; but with levulose an intense reaction occurs in ten minutes. *Aldehydes* and *ketones* give a ruby-red color with the reagent, and *uric acid* gives a similar reaction to the aldoses. *Albumins*, *albumoses*, *amide acids*, *urea*, and *creatinine* give a yellow tint. The presence of these bodies does not interfere with the production of the violet color by levulose. A good reaction may also be obtained in the presence of milk.—Pharm. Journ., May 18, 1907, 649; from Nouv. Remédes, 23 (1907), 174.

Sugar—New Test.—H. J. H. Fenton recommends a new test for sugar, which is particularly applicable to urine. It depends upon the fact that

all carbohydrates of the hexose, or polyhexose, type (such as dextrose, lævulose, cane sugar, milk sugar, or maltose) yield a certain amount of bromo-methyl furfural, $\text{CH}_2\text{Br}-\text{C}_4\text{H}_3\text{O}-\text{CHO}$, when acted upon by hydrobromic acid under appropriate conditions; and further, that the latter substance reacts with malonic ester in presence of alkalies, giving rise to a product the solutions of which exhibit a powerful blue fluorescence. The conditions most favorable for the action of hydrobromic acid are obtained when phosphorus tribromide is dissolved in some inert solvent, such as toluene, and the solution is heated with the carbohydrate in presence of water; excess of water, however, must be avoided. For the examination of urine the test is most conveniently applied in the following way. Pour a small quantity (4 or 5 Cc.) of the liquid on an excess of solid anhydrous calcium chloride so as to form a semi-solid, or pasty, mass. Add to this 10 Cc. of toluene containing two or three drops of phosphorus tribromide and then carefully boil the mixture for a few minutes, bearing in mind the inflammable nature of toluene. Pour off the toluene solution and, after cooling, add to it about 1 Cc. of malonic ester and a little alcohol. On neutralizing the mixture by adding alcoholic potash, drop by drop, a characteristic pink color will usually be observed. The mixture is now considerably diluted with alcohol and a few drops of water when, if sugar was originally present, the solution will exhibit a beautiful blue fluorescence. The reaction appears to be a specific one for carbohydrates which contain six or more atoms of carbon in the molecule, and may therefore be used to distinguish hexoses from pentoses or other lower sugars.—Pharm. Journ., Feb. 2, 1907, 107; from Lancet, Jan. 26, 1907.

Sugar—Transformation into Alcohol without Enzymes.—The brown color produced when dextrose is treated with alkalies is found to be due to the resinification of aldehyde, which is formed as one of the products of the reaction. H. Schade has now been able to carry out the reaction in such a way as to prevent resinification, and obtained a mixture of formic acid and acetic aldehyde. On warming this mixture at 60°C . in the presence of finely divided rhodium the formic acid was broken up into carbon dioxide and hydrogen, the latter reducing the aldehyde to ethyl alcohol.—Pharm. Journ., July 28, 1906, 105; from Chem. Ztg., 1906, 30, 569.

Milk-Sugar—Detection of Saccharose.—Prof. Henry Leffmann has observed that the reaction of milk-sugar with sesame oil and hydrochloric acid can be utilized for the detection of cane-sugar. It suffices to mix a small amount of sesame oil and strong hydrochloric acid with the milk-sugar, shaking actively for a few seconds, and then allowing the mixture to stand. Pure milk-sugar produces a faint blue tint, but as little as 1 per cent. of admixed cane-sugar will produce the characteristic red tint.—Proc. Penna. Pharm. Assoc., 1906, 163.

ORGANIC ACIDS.

Diluted Acetic Acid—Commercial Variation in Strength.—H. Seidman finds great variation in the strength of diluted acetic acid obtained from both wholesale and retail sources. Three samples from wholesale stores assayed 8.25 per cent., 10.44 per cent., and 13.09 per cent.; while three samples from retail stores showed 5.25 per cent., 5.83 per cent., and 11.04 per cent. None of the six samples showed more than traces of impurities.—*Amer. Journ. Pharm.*, Sept., 1906, 417.

Malt Vinegar—Process of Manufacture in England.—In a paper read before the Sheffield Pharmaceutical and Chemical Society, John Evans describes the manufacture of malt vinegar on a commercial scale. The unmalted grain (maize grit) is steamed under a pressure of two or three atmospheres, whereby the cells of the grain are ruptured and the liberated starch-grain gelatinized, thus being easily acted on by the malt-diatase. This process is done in a "converter," a cylindrical iron vessel, having an inlet for steam at the top and another tube at the bottom, from which, after gelatinization, the pulp is blown out into the mash-tun. There ground malt and water are mixed with it. Mechanical stirrers are placed just above the false bottom of the mash-tun. The mixture is infused for some time with constant agitation, and when the action of the diastase is complete, the clear infusion is run off from under the false bottom, and water is sprinkled upon the malt from the revolving sparger (four revolving sprinkling arms), and the wort run off until the requisite volume is obtained. The wort is run through a refrigerator to cool it. Fermentation is the third stage in the process. Yeast is added to the liquor, and fermentation pushed so as to produce the maximum quantity of alcohol. Reduction of specific gravity, technically known as "attenuation," indicates when the liquor is ready; then it is run off and forced through the filter-press to remove all the yeast, which is a valuable by-product. The liquid, or vinegar wash, is now ready for acetification, which is done in casks 14 feet high and 12 feet in diameter, filled with bundles of birch-twigs (freed from sap and coloring-matter), supported on a false bottom. Vinegar-wash is pumped to the top of this acetifier, where it is sprinkled, by means of a revolving sparger, in fine streams over the birch-twigs, and the process is repeated until the liquid shows the required percentage of acetic acid. Growth of "mother of vinegar" is started on the twigs by allowing warm vinegar to percolate over them. The process of acetification takes about eight or nine days, and the percentage of acetic acid in the liquid is determined every day. Thus on the third day 2.19 per cent. of acetic acid was shown, the temperature being 40° C.; on the fourth day, 2.76 per cent., temperature 43.3° C.; and the acidity increased up to 4.29 per cent. on the eighth day at the same temperature. In practice the whole of the alcohol is not converted into acetic acid, as a small proportion of alcohol is found to give the vinegar keeping-properties and also

ensures a gradual formation of acetic ether. The vinegar is finally passed through a clarifier, which in form resembles the acetifier, and is packed with beech shavings. After this it is stored in wooden vats before being sent out.—Chem. and Drugg., May 25, 1907, 809.

Thio-acetic Acid—Preparation and Properties.—J. Houben and H. Pohl prepare thio-acetic acid, $\text{CH}_3\text{CS.SH}$, as follows: Carbon disulphide is added slowly to a cooled solution of methyl magnesium iodide, which gradually turns a dark red-brown, and begins to emit a very piercing and characteristic smell. The liquid often separates into two layers. It is cooled, and first ice is added and then cooled hydrochloric acid. The red-brown ethereal layer is removed, extracted with dilute soda solution, and the solution is then extracted five or six times with ether to remove impurities of the nature of mercaptans. Ice-cold hydrochloric acid is added, and the free thio-acid taken up in ether. The acid is a reddish-yellow strong smelling oil, its odor recalling mercaptan, allyl sulphide, and acetic acid. It is practically insoluble in water. Its analysis leaves no doubt that its composition is represented by the formula $\text{CH}_3\text{CS.SH}$, and its low boiling-point (37° under 15 Mm. pressure), and other properties show that it is not a polymer of $\text{C}_2\text{H}_4\text{S}_2$. The specific gravity at 20°C . is 1.24. It yields neutral soluble salts with alkalis. It is a very strong acid, and replaces acetic acid in its salts. It does not ignite easily, but on warming it burns with a blue flame, yielding sulphur dioxide and carbon.—Chem. News, May 10, 1907, 227; from Ber. d. D. Chem. Ges., xl, No. 6 (1907).

Acetone—Biological Formation in the Urine.—It is well known that acetone is always found in the urine of persons who have suddenly become violently ill after partaking of fish or flesh containing decomposition products (ptomaines). The idea was therefore suggested to Alex. Müller that the acetone found in the urine of diabetics might also be due to the presence of decomposition products of albumen in the urine, and experiments now recorded by him have determined the correctness of this assumption. The acetone is not formed direct from either the organ albumen or fat, but only when, during the decomposition, ptomaines have first been formed, the formation of bases and of acetone going hand in hand.—Pharm. Ztg., li, No. 92 (1906), 1019.

Acetone.—Simple test for its presence in urine, which see.

Acetone—Superior Reagent for its Identification.—Porcher and Hervieux recommend orthonitrobenzaldehyde, originally employed by Penzoldt, as the best reagent for the identification of acetone. To several cubic centimeters of the suspected liquid a few crystals of the reagent are added; the liquid is neutralized with a few drops of solution of sodium hydroxide, and gently heated. In the presence of acetone the mixture turns yellow, then green and finally, in consequence of the formation of indigo, becomes blue. The latter may be readily shaken out by chloro-

form.—Pharm. Ztg., lii (1907), No. 46, 477; from L'Union pharm., 1907, No. 5.

Benzoic Acid—Distinction of the Natural from the Synthetic Product.—Cormimboeul and L. Grossman find that the natural acid from benzoin when boiled with water containing soda develops a peculiarly agreeable aromatic odor, while the synthetic acid treated in the same way manifests a distinctly different odor, reminding of parsley, but that this test of distinction fails completely if small quantities of natural benzoic acid have been added to the synthetic acid. The two acids are, however, sharply distinguished by the small chlorine content of the synthetic acid, due to the chlorination of the toluol used for its preparation. This test is carried out by mixing 5 Gm. of the acid with 5 Gm. of soda free from chlorine, and heating the mixture in a platinum crucible until the organic substance is completely destroyed. The presence of chlorine may then be determined in the product of fusion, by solution in water, acidulation with nitric acid, and addition of silver nitrate.—Pharm. Ztg., li, No. 80 (1906), 886; from Ann. Chem. anal. appl., 11, 243.

Strontium Benzoate—Characters.—R. Paietta has prepared strontium benzoate, a salt not heretofore described, by saturating an aqueous solution of benzoic acid with strontium carbonate. So obtained it is a heavy, white crystalline powder, soluble in water at 15° C. to the amount of 5 per cent., and forming neutral solutions. The crystals contain rH_2O , which is driven off by heating to 130°–140° C.—Pharm. Ztg., li, No. 80 (1906), 888; from Bollet. Chim. Farm., 1906, No. 13.

Benzosalin—Characterization.—According to F. Zernik, benzosalin, or methyl-benzoyl-salicylic acid, is a white crystalline powder of feebly aromatic odor and taste. Melting-point, 84° to 85° C. Almost insoluble in water, soluble in 35 parts of alcohol, very freely soluble in chloroform, less so in ether. An alcoholic solution (1 in 50) should not be colored violet by a drop of solution of ferric chloride, and should not exhibit more than an opalescence on the addition of nitric acid and silver nitrate. If 0.5 Gm. is boiled for three minutes with 10 Cc. normal solution of soda, the liquid filtered when cold, and the filtrate acidified with dilute sulphuric acid, a crystalline magma should separate, which is to be collected and washed. 5 Cc. of decinormal solution of soda poured on the magma on the filter yields a filtrate in which one drop of solution of ferric chloride produces a reddish-brown precipitate and brown liquid; the latter, however, changes to deep violet on the further addition of ferric chloride.—Apoth. Ztg., xxi (1906), No. 90, 962.

Cinnamic Acid.—Rapid reduction to cinnamene by the action of the ferments formed in cultures of *Aspergillus niger* and *Penicillium glaucum*. See *Moulds* under “Materia Medica.”

Citric Acid—Modification of G. P. Test for Tartaric Acid and Sugar.—

The German Pharmacopœia prescribes as a test for the presence of tartaric acid or sugar in citric acid, that the sample be heated with sulphuric acid one hour on a water-bath, consequently at a temperature of 90° – 100° C. Dr. G. Mossler, however, finds that when this mixture is heated beyond 90° , the color developed even with pure citric acid is much deeper than that prescribed for pure acid (light wine-yellow). He therefore recommends that the heating should not exceed 80° , at which temperature both tartaric acid and sugar, when present in larger quantity than 0.5 per cent., develop a distinct increase in the expected color.—Pharm. Ztg., lii, No. 6 (1907), 56; from Ztschr. d. Allgem. Oersterr. Ap.-Ver., No. 1, 1907.

Citrates and Tartrates—Detection.—In the course of separating nickel and cobalt by means of alkaline tartrate, I. F. Tocher noted the bright color and sparing solubility of cobalt tartrate. Nickel salts undergo no intensification of color on the addition of a tartrate. If, instead of passing H_2S through the solution, excess of soda or potash is used, the color of the cobalt tartrate is discharged, and a clear solution is obtained if cobalt alone be present, while a greenish precipitate and green solution are obtained if nickel alone be present. On boiling the alkaline tartrated cobalt solution, a deep blue color was developed, which disappeared on cooling and reappeared on again warming the solution. The behavior of citrates is different. On adding excess of alkali to a mixture of an alkaline citrate and a cobalt salt, a deep blue solution is immediately produced. The behavior of twenty-eight inorganic acids with the alkaline cobalt reagent was noted, and in no case was the reaction similar to either the tartrate or citrate reactions. The action of cobalt alkali on fourteen organic acids was noted, and it was found that malic acid gives a blue solution in the cold similar to what citric acid gives. Since malic acid may be distinguished from citric acid in a variety of ways, the properties of the malates of lead, calcium, and ammonium being prominent, their similar behavior with cobalt and alkali merely serves to group them for more ready identification.—Trans. Brit. Pharm. Conf. (Year-book of Pharm.), 1906, 304–307.

Pure Potassium Bitartrate—Simple Method of Preparation for Standardizing.—According to P. Carles the methods usually recommended fail to produce potassium bitartrate sufficiently pure for the purposes of standardization and are quite unsatisfactory. He finds that the following method alone will serve to produce pure potassium acid tartrate that is suitable for the purpose. One hundred grams of pure, well-formed crystals of tartaric acid are dissolved in about a liter of boiling distilled water, filtered if necessary, and divided into two equal volumes. One-half is exactly neutralized with pure potassium carbonate; the other half is added to the neutral liquid; on cooling potassium acid tartrate separates. It is collected, washed and dried. It is pure but slightly hygroscopic. It

is, therefore, re-dissolved in boiling water, and re-crystallized from porcelain vessels. The crystals are drained, crushed, washed with tepid water, and dried to constant weight. This product is quite pure.—*Pharm. Journ.*, April 20, 1907, 493; from *Jour. de Pharm. et Chim.*, 25 (1907), 333.

Formic Acid—Rapid Volumetric Estimation.—According to E. Rupp the volumetric determination of formic acid is more rapidly and efficiently effected in alkaline than in acid solution. A measured volume of the very dilute solution of formic acid or formate (containing less than 1 per cent.) is introduced into a glass-stoppered flask with a considerable excess of approximately $\frac{N}{10}$ solution of permanganate (the exact titer having been just previously determined by means of thiosulphate); the rinsings are added, followed by about 0.5 Gm. of pure, dry soda, and the mixture is heated for 15 to 30 minutes on the water-bath. After cooling, it is diluted with about 75 Cc. of water, 25 Cc. of diluted sulphuric acid and 1 to 2 Gm. of potassium iodide are added, and the quantity of separated iodine ascertained in the usual manner, by titration with $\frac{N}{10}$ thiosulphate solution.—*Pharm. Ztg.*, li, No. 89 (1906), 987; from *Ztschr. f. analyt. Chem.*, 45 (1905), No. 11.

Picric Acid—Application for the Identification and Estimation of Organic Bases.—The firm of J. A. Riedel direct attention to the utility of picric acid for the identification and estimation of most of the synthetic bases, as well as some of the natural bases at present in use. These bases are characterized by forming well crystallized picrates, of very sparing solubility, and well defined melting-points, which are usually obtained by adding to their concentrated aqueous or alcoholic solution a slight excess of cold saturated solution of picric acid, warming the turbid mixture produced, without shaking, until a clear solution results, and then permitting it to cool slowly. In this way the picrate separates out in a well crystallized form and is easily collected, but if the mixture is shaken, the picrate separates in lumpy aggregations which adhere to the sides of the vessel. Well crystallized picrates have been obtained with the following bases: Stovaine, novocaine, alpine, cocaine, tropacocaine, nirvanine, anæsthesine, *α*-scopolamine, atropine, hydrastinine, pilocarpine, eucaine and atipyrine.—*Pharm. Ztg.*, lii (1907), No. 28, 292; from J. A. Riedel's *Berichten.*, 1907.

Picrolonic Acid—Use as Alkaloidal Precipitant in Assays.—H. Matthes and O. Rammstedt record the results of a comprehensive series of investigations which demonstrate the utility of picrolonic acid (= dinitrophenylmethylpyrazolon) as an alkaloidal precipitant in the assays of narcotic drugs, extracts and tinctures. L. Knorr has shown that this acid is an excellent precipitant for most alkaloids and many other bases, forming difficultly soluble salts of constant composition and high melting-point, and superior in these respects to picric acid (which see). The authors

describe the process for the preparation of this acid, which is based on that of R. Leine, and give the method of its application for the assay of various extracts, fluidextracts and tinctures, which is well exemplified in the following :

Assay of Extract of Nux Vomica.—1.0 Gm. of the extract is dissolved in 5.0 Gm. of absolute alcohol and 5.0 Gm. of water, well shaken with 50.0 Gm. of ether and 20.0 Gm. of chloroform, and then for 10 minutes, with 10.0 Cc. of soda solution (1 + 2). The mixture is set aside 20 minutes, then filtered through a double filter, 50.0 Gm. of the filtrate evaporated in a beaker to one-half, and while still warm treated with an excess (about 5.0 Cc.) of $\frac{N}{10}$ alcoholic solution of picrolonic acid. The yellow crystalline precipitate of brucine and strychnine picrolonate, which separates in a short time, is collected after 24 hours on a Gooch filter, carefully transferring the picrolonate completely upon the filter by the aid of the filtrate. It is then washed with 2 Cc. of alcohol-ether (1 Cc. alcohol + 3 Cc. ether) to remove excess of picrolonic acid, dried for 30 minutes at 110° C., and, after cooling in the exsiccator, weighed. The calculation is made on the basis of the average molecular weight of brucine-strychnine, which is 364.32, and of the picrolonate, which is 628.32—the ascertained weight being multiplied by the factor 0.5798 to give the quantity of brucine-strychnine in the sample under examination. The results obtained by this method as an average of 12 determinations, and compared with the average percentage of 6 determinations by the method of the German Pharmacopœia, were closely concordant. The amount of alkaloids found by the official method was on the average 19.8066 per cent. By the picrolonic-acid method with identical samples of extract, it was 18.9242 per cent., while almost identical results were obtained by two independent experimenters engaged in the same laboratory.—Arch. de Pharm., 245 (1907), No. 2, 112-132.

Salicylic Acid—Theory of Its Synthesis by Kolbe's Method.—In an address before the recent Convention of Netherlands Naturalists, Moll van Charante advances the theory that the first intermediary product of reaction in Kolbe's synthesis of salicylic acid by means of sodium phenate and carbon dioxide consists of an addition compound of sodium phenate and sodium phenolcarbonate, and that this then resolves itself into sodium phenite and sodium salicylate.—Pharm. Ztg., lii (1907), No. 36, 373; from Chem. Ztg., 1907, No. 34.

Bismuth Bisalicylate is a compound produced under an American patent by double decomposition between solutions of a normal bismuth salt and of a salicylate the base of which forms a soluble salt with the acid of the bismuth salt, carefully avoiding a rise in temperature during the reaction, which would result in the decomposition of the disalicylate formed. The free salicylic acid liberated during the reaction is removed,

either by means of an indifferent solvent or by neutralization and washing. Bismuth bisalicylate forms a fine, white, tasteless powder, having a faint sweetish after-taste. Extracted with cold water, the latter has a neutral reaction; suspended in water it gives a violet color with ferric chloride; boiled with dilute NaOH and filtered, the filtrate yields a precipitate of salicylic acid on addition of HCl. On boiling it with water, it is split up into salicylic acid and bismuth subsalicylate. It is composed of 48 to 50 per cent. of Bi_2O_3 and 50 to 52 per cent. of salicylic acid. Therapeutically it combines the astringent and antiseptic effects of its components, and is recommended as a superior antiseptic in fermentative and putrefactive conditions of the duodenum, and in catarrhal affections of the intestinal tract in general, in doses 0.7 to 0.8 Gm.—Pharm. Ztg., lii (1907) No. 18, 179.

Succinic Acid—Use for Establishing the Titer of Volumetric Solutions.—Phelps and Hubbard recommend succinic acid for establishing the titer of volumetric solutions. The commercial acid, purified by recrystallization from water acidulated with nitric acid, answers the purpose. It is quite as reliable as hydrochloric acid, which has heretofore been preferred for this purpose, and more convenient than the latter, for it serves to simply dry the succinic acid in the air after sufficient recrystallizations, whereas the titer of the hydrochloric acid itself must first be determined gravimetrically. A very pure succinic acid may be obtained by hydrating its anhydride, and also by the hydrolysis of pure succinic acid esters.—Pharm. Ztg., lii (1907), No. 46, 477; from Ztschr. f. anorg. Chem., 1907, 161.

Tannins—Composition and Characters of Different Kinds.—E. Strauss and B. Gschwendner have prepared and investigated the tannins from different materials, with results as follows:

Quebracho-Tannin $[\text{C}_{41}\text{H}_{44}\text{O}_{18}(\text{OCH}_3)_2]_2$ was obtained from the bark of *Quebracho colorada* by extracting successively with chloroform and with alcohol; on adding water to the alcoholic extract and warming phlobaphenes were deposited and were removed from the solution by shaking with Tripoli powder. On concentrating the solution in a vacuum lead acetate was added, when the tannin was precipitated in form of a lead salt, which was subsequently filtered off, suspended in water, and decomposed by a current of hydrogen sulphide. The filtrate from the lead sulphide was then evaporated in a vacuum, and the residue, after taking up in the least amount of alcohol, was poured into absolute ether. In this way the tannin was obtained in light flakes, which were rapidly dried in a vacuum over sulphuric acid and phosphoric oxide, as they at once become sticky on exposure to moist air. Analyses led to the formula $\text{C}_{43}\text{H}_{36}\text{O}_{20}$. On heating the tannin with a mixture of glacial acetic acid and acetic anhydride, an acetyl derivative is obtained, which, however, has the formula $[\text{C}_{30}\text{H}_{22}\text{O}_{11}(\text{COCH}_3)_6]_2$; it forms a white powder which is fairly readily

soluble in alcohol, very soluble in acetone, ethyl acetate, glacial acetic acid or acetic anhydride; but is insoluble in water, ether or benzene. The corresponding benzoyl derivative $[2C_{30}H_{22}O_{11}(COC_6H_5)_6]_2$, is a white solid which darkens at $200^\circ C.$ and decomposes at $215^\circ C.$ When reduced with sodium amalgam the tannin yields a substance of the formula $(C_{30}H_{26}O_{11})_2$.

Maletto-Tannin $(C_{43}H_{30}O_{20})_2$, obtained from finely-powdered Maletto bark, by extraction with 96 per cent. alcohol, appears to be identical with *Quebracho* tannin.

Tea-Tannin, $C_9H_{10}O_3$, was obtained from finely-powdered black tea, by a process of extraction and purification similar to that described under *Quebracho* tannin. It forms an almost white powder. If lead acetate is employed in its purification a compound is obtained which has the formula $C_{13}H_{19}O_{10}$.

Sumach-Tannin, $C_{16}H_{15}O_{11}$, was prepared according to Loewe's method. It was found to have the composition expressed by the formula $C_{33}H_{20}O_{11} \cdot OCH_3$.—Pharm. Journ., Nov. 3, 1906, 489; from Ztschr. f. angew. Chem., 1906, 19, 1121.

Pure Filicitannic Acid—Method of Preparation and Characters.—W. Wollenweber prepares pure filicitannic acid as follows: Dry, powdered male-fern rhizome is exhausted by percolation with alcohol; the tincture is concentrated in portions of not more than 100 Cc. at the lowest possible temperature and in a vacuum, the small separate portions of extract being finally united. This alcoholic extract is then treated with a large volume of ether, which removes chlorophyll and fat, but leaves the filicitannic acid undissolved; the latter is finally exhausted with ether in a Soxhlet and dried. The ethereal solutions can be utilized for the preparation of the various substances belonging to the filicic acid group. The filicitannic acid may finally be dissolved in cold water, the solution filtered and evaporated in shallow dishes on a water-bath; the powdered residue is pure filicitannic acid. The yield was 7.8 per cent. of the dry rhizome. Filicitannic acid thus prepared is a reddish-yellow powder, soluble in water in all proportions, but not giving any indication of dextro-polarization in a 1 per cent. solution. Although so very soluble in water this menstruum only dissolves small quantities of it from either fresh or dried rhizome. It is insoluble in ether, benzene, petroleum spirit, carbon disulphide and chloroform. It precipitates solutions of gelatin, albumen, strychnine and quinine. It contains nitrogen, the molecular formula being $C_{41}H_{44}NO_{22} + 2H_2O$. For this substance the name proto-filicitannic acid is proposed. Heated to $100^\circ C.$ it loses $2H_2O$, without, however, becoming less soluble in water. At 125° it parts with a further $4H_2O$, becoming converted into filicitannic anhydride, $C_{41}H_{36}NO_{18}$, which is very slightly soluble in water. At 148° it loses further $2H_2O$, yielding a second filicitannic anhydride.—Arch. d. Pharm., 244, 1906, No. 6, 466.

Tannic Acid of Uva Ursi.—Characteristic color reactions with vanillin-hydrochloric acid and with ferrous sulphate solution. See *Uva Ursi*, under "Materia Medica."

Bismutum Bitannicum is obtained by the admixture of solutions of a normal bismuth salt and of a tannin salt, the base of which forms a soluble salt with the acid of the bismuth salt, avoiding a rise in temperature during the reaction, then washing and drying the bismuth tannate precipitated. It is a light-yellow powder, having a faint acidulous-bitter taste, producing with cold water a neutral filtrate which gives only a very faint blue coloration with ferric chloride, soluble in dilute NaOH with a red-yellow color, and splitting off tannin when boiled with water. It contains about 20 per cent. of Bi_2O_3 . Recommended as a remedy for chronic intestinal catarrh, in doses of 0.5 Gm., and is believed to be useful also for the treatment of weeping eczemas.—Pharm. Ztg., lii (1907), No. 18, 180.

ORGANIC BASES.

Alkaloids and their Salts.—*Tabular Survey of those Official in the U. S. P.*—Azor Thurston publishes a tabular arrangement of the pharmacopœial alkaloids and alkaloidal salts, which permits a rapid survey of their source and important characters, etc., under the following captions: Official Latin Title; Formula and Molecular Weight; Source; Habitat of Plant; Per Cent. of Alkaloid in Plant; Solubilities, in water, in alcohol, in ether, in chloroform and in other solvents; Melting-point; Therapeutic Action; Average Dose; Characteristic Reactions. The paper is useful only in its entirety, and must therefore be consulted in the original in Merck's Rep., September, 1906, 256-259.

Alkaloidal Salts.—*Extraction by the Process of Perforation*.—A. Simmer contributes a comprehensive study of the so-called process of perforation as applied to the extraction of alkaloids and other bodies by means of chloroform and other volatile solvents, and particularly also the extent to which both the alkaloids and the solvents may undergo decomposition during the process. He finds that neutral alkaloidal salt solutions show a marked tendency to yield the free base to chloroform. The extent of this depends on the extent to which dissociation takes place, strong bases, such as nicotine and atropine, especially when combined with strong acids, yielding practically nothing to chloroform. Salts of veratrine, brucine, codeine, cocaine and morphine part more readily with the base; narcotine still more so. In many cases the alkaloidal salt itself passes into the chloroform; this is particularly the case with nitrates and the halogen salts, but not with sulphates, phosphates, tartrates, or citrates. If excess of acid is present the tendency of the salts of the more basic alkaloids to part with the alkaloid is either entirely obviated or much reduced, but, if the salt is soluble in chloroform, it passes out more freely. In toxicological and other analyses, therefore, the halogen acids should be

avoided, or at least used in slight excess only, the use of sulphuric, phosphoric, tartaric, or citric acid being preferable. The addition of even strong acids to very weakly basic acids such as colchicine and caffeine is without effect, whilst the passage of narcotine and papaverine is hindered, but not prevented. Benzene also removes alkaloids from neutral solutions of their salts, but in smaller proportion than chloroform; the alkaloidal salts themselves pass with great difficulty into benzene, none but strongly acid solutions of the hydrochlorides, hydrobromides, and nitrates yielding traces of the salt. Carbon tetrachloride removes still less than benzene. Experiments with the free alkaloids and chloroform proved that decomposition of the chloroform by the alkaloid takes place to so small an extent as to be in practice quite negligible. The author has also studied in this connection the reducing power of vegetable alkaloids and their salts upon different reducible saline compounds, such as silver, gold, mercury, platinum, copper and iron salts, potassium permanganate, as well as chromic and iodic acids.—Arch. d. Pharm., 244 (1906), No. 9, 672-684.

Alkaloid-Determination in Drugs—Fats a Possible Source of Error.—In the Fall Report (1906) of Cæsar & Loretz, G. Fromme calls attention to a possible source of error in the alkaloidal assay of drugs, due to the presence of fats, oils or wax, which being saponified by the alkali used in the shaking-out process are not excluded from solution in the ether or chloroform used for extraction. If then such ether or chloroform solution is shaken out with volumetric acid, a portion of this acid is consumed for the decomposition of the saponified fat dissolved, and to the extent of the quantity of the soap present the estimation of alkaloid will be vitiated. This is particularly important in the case of the assay methods of the G. P., in which the amount of acid consumed is regarded as being combined with alkaloid.—Pharm. Ztg., li, No. 75 (1906) 830.

Alkaloidal Assays, U. S. P. VIII.—Criticism.—H. M. Gordin observes that an examination of the assay methods of crude drugs of the U. S. P. VIII shows them to be different for different drugs without any apparent good reason; for while it is true that not every method is suitable for every drug, it would nevertheless seem to be advisable to adhere to one and the same method wherever it gives as good results in the one case as in another. Comparing, for example, the methods adopted for the assay of aconite, belladonna, and ipecac, it is difficult to see why the simple method adopted for aconite could not give as good and concordant results for the other two drugs. Again, on comparing the assay methods for the fluid-extracts of cinchona bark, aconite, belladonna, and ipecac roots, it would seem that the simple and exact method adopted for the assay of fluidextract of belladonna root would also give good and concordant results with the other fluidextracts mentioned. In some of the official assay methods

care has been taken to avoid the use of aliquot parts of the real liquids, whereas in others no such care was taken. Instead of dissolving solid extracts direct in the separator, in some assays the solid substance is dissolved in the ether or chloroform mixture and the solution transferred to the separator, thus occasioning more or less loss. Furthermore, some of the assay methods of the pharmacopœia are completely unworkable. Such, for example, are the assays of aconite root, its fluidextract, and fluidextract of ipecac root, in all of which we are directed to filter the first liquids obtained in these assays; but as these liquids are very thick and contain sticky resinous substances, the filters are very soon completely clogged and the assays cannot be finished. The author takes up the individual assays in the order in which they occur in the pharmacopœia and points out the directions in which they are deficient and require correction.—*Amer. Journ. Pharm.*, Octob., 1906, 453-457.

U. S. P. Assay Processes for Alkaloids—Criticisms.—W. A. H. Naylor and E. J. Chappel, in a paper on "Fluidextracts of Belladonna, Ipecac and Nux Vomica, U. S. P.," observe that in studying some of the processes for alkaloidal assay described by the U. S. P. one cannot but be struck by the fact that in several instances the percentage of alkaloid is determined by the titration of an unweighed residue. This method of procedure is not free from certain defects, and in some cases would tend to give too high results. That the estimation by titration of an alkaloid which has been precipitated from a solution and well washed till free from the precipitant can be accurately carried out on the moist alkaloid is not open to question. But when dealing with alkaloidal residues from solvents which have been shaken with ammoniacal solutions the conditions are somewhat different. The alkaloidal residue obtained is frequently of a varnish-like nature, and in this state is peculiarly adapted for the retention of ammonia, the presence of which would vitiate the titration results. This would apply with special force to cases in which the evaporation of the solvent is permitted to be carried out at ordinary temperatures. The most usual instruction in the U. S. P. for drying extracted alkaloids is to evaporate the solvent till the residue is "dry," or "quite dry." Surely all alkaloidal residue obtained by the evaporation of solvents which have been in contact with ammoniacal solutions should be dried to constant weight, and as many of them cannot be exposed to high temperatures without undergoing some change, the temperature not to be exceeded in drying should be stated in each case. Such an instruction would lengthen the time required for the estimation, but it would be justified by the increased accuracy attained. Where the alkaloid extracted is fairly pure the weight would be a useful check on the titration results. When a fixed alkali is used for liberating the alkaloid in the last stage of a process, drying will not lessen any error which may be caused by traces of alkali having passed into the immiscible solvent. The authors, in further support and elucidation of their criticisms,

communicate the results of practical observations and experiments made with the U. S. P. processes of assay as applied to the three above-named fluidextracts, which must be consulted in the original.—Pharm. Journ., March 30, 1907, 393-395.

Alkaloidal Assays, U. S. P., VIII—Lack of Uniformity in Methods.—In the course of a review of the literature on the estimation of alkaloids for the year 1905, W. A. Puckner observed that while that year has not shown any very decided progress in the estimation of vegetable bases, it has brought forth one contribution of much importance and considerable merit, namely the Eighth Decennial Revision of the United States Pharmacopœia. The methods of alkaloid determination thereby made official are a credit to American pharmacy even though they do represent our knowledge of to-day; the sub-committee to whom this part of the revision of the Pharmacopœia was delegated having virtually completed its labors a year or two prior to the publication of the book. Referring to the adoption of the "Keller Method" for crude drugs when applicable, generally with the modification, proposed by the author, whereby maceration and percolation are combined and the need of taking an aliquot portion of the volatile chloroform-ether solution of the alkaloid is avoided, Professor Puckner observes that although the adoption of this method of macroprecipitation has been favorably commented on by English critics as being the most interesting feature of the new Pharmacopœia, to him the most striking feature is the inconsistency, shown in the adoption of assay processes, by the evident lack of co-operation or of system in the work of the sub-committee having this work in charge. Instead of deciding on some general principle for the methods of assay to be selected and then to adapt some general method to suit the needs of each drug, as analysts will naturally attempt to do, in general each drug has been considered by itself. Moreover, while it is desirable to adapt the method of assay for a drug to its preparations, such relation often is not shown in the official methods.—Pharm. Rev., Aug., 1906, 228.

Alkaloidal Assay—Tabulated Review of the Processes of the U. S. P., VIII.—Frank X. Moerk has constructed two elaborate tables which permit a convenient review of the more important details of the assay processes of the U. S. P., VIII, the one embracing the volumetric, the other the gravimetric methods of assay. These tabulations reveal a number of important points, which are briefly discussed by the author: 1. That the usually accepted statement that 1 Cc. of the fluidextract is the equivalent of 1 Gm. of a drug is not correct in all cases. 2. That many of the so-called 10 per cent. tinctures do not represent exactly 10 per cent. of the drug. 3. That the same variation from the commonly accepted strength as compared with the drug obtains in the case of extracts. 4. That the alkaloidal factor in each assay process compared with the factor given in the volumetric

table, coincides only in the case of the alkaloids of the solanaceæ, while in all others it is either somewhat higher or somewhat lower. 5. That it would be a good plan to readjust the quantities used for the different assays, so as to require a more uniform volume of the volumetric solution, and thus make any error inherent in the assay process as near as possible a uniform one. 6. Attention is called to the Alphabetical List of Volumetric Assays in the Pharmacopœia, in which no mention is made of the assays of stramonium and of tincture of nux vomica.—Proc. Penna. Pharm. Assoc., 1905, 157-160.

Alkaloidal Assays—Value of Iodeosin as Indicator.—Charles E. Vanderkleed regards iodeosin as the most desirable indicator in alkaloidal assay-work, and regrets that the U. S. P., VIII, does not more emphatically advocate its use, instead of leaving it optional in such cases as the assays of belladonna, henbane, stramonium, coca, pilocarpus, etc. Instead of following the general directions of the U. S. P., he prefers to make the titration with iodeosin as indicator as follows: A solution of alkaloidal residue in excess of standard acid is transferred to an 8-ounce bottle, diluted to about 100 Cc. with distilled water, about 30 Cc. of ether added, and lastly, 5 to 8 drops of a 0.5 per cent. solution of iodeosin in alcohol. The bottle is stoppered and vigorously shaken after each addition of centinormal alkali; the end reaction being marked by the appearance of a rose-pink tint in the aqueous layer.—Proc. Penna. Pharm. Assoc., 1906, 134.

Alkaloidal Assay—Application of Picrolonic Acid.—H. Matthes and O. Rammstedt, on the bases of results obtained with nux vomica, hy drastis, and jaborandi and their preparations, recommend picrolonic acid (= dinitrophenylmethylpyrazolone) for the alkaloidal valuation of drugs. The method adopted is exemplified in the following process applied to the

Valuation of Extract of Nux Vomica.—One Gm. of the extract is dissolved in 5 Gm. of absolute alcohol and 5 Gm. of water; the mixture is then well shaken up with ether, 50 Gm., and chloroform, 20 Gm.; 10 Cc. of soda solution, 1 to 2, is then added, and the whole shaken for ten minutes, and allowed to separate for twenty minutes. The ether-chloroform extract is filtered through a double filter, and 50 Gm. of the filtrate evaporated to one-half; while warm, an excess, generally 5 Cc. of $\frac{N}{10}$ alcoholic picrolonic acid is then run in. After standing twenty-four hours the crystalline brucine-strychnine picrolonate is collected on a Gooch crucible, washed with 2 Cc. of a mixture of ether, 3 Cc. alcohol, 1 Cc., then drained, dried for thirty minutes at 110° C., and weighed. The molecular weight of brucine picrolonate being 658, of strychnine picrolonate 598, and of brucine-strychnine picrolonate 628.38, the weight obtained, $\times 0.5798$, gives the equivalent of brucine-strychnine. With tincture of nux vomica the alkaloids may be precipitated direct as picrolonates with

a fair amount of accuracy; 25 Gm. of the tincture are taken, diluted with an equal weight of water, treated with 5 Cc. of $\frac{N}{10}$ picrolonic acid solution, evaporated to one-half on the water-bath, then set aside for twenty-four hours. The picrolonate precipitate is treated as above. The method as applied to the other drugs named varies in some particulars, and may be consulted in the original.—Arch. d. Pharm., 245 (1907), No. 2, 112-132.

Alkaloids—Appropriate Solvents.—While chloroform must be regarded as the best general solvent for alkaloids, it has the disadvantage that its solutions are liable to emulsify when toxicological analyses are made, and that a few alkaloids are unfavorably affected by it. "Nouv. Remèdes" (1906, No. 22) therefore mentions the solvents best adapted for the different alkaloids, as follows: *Acetic ether*, for amorphous aconitine, crystallized atropine, brucine, hyoscyamine and morphine; the same, or *benzol*, for cocaine; the latter also for strychnine; *ether*, or ether saturated with water, for colchicine; the latter also for cinchona alkaloids. *Tetrachloride of carbon* is not suitable for the extraction of alkaloids.—Pharm. Ztg., li, No. 98, 1083.

Bebeerine—Crystalline Form, etc.—Dr. M. Scholtz, calling attention to the identity of the so-called "pelorine" ($C_{18}H_{21}NO_3$) from *Pareira brava* with the alkaloid "bebeerine" obtained from the bark of *Nectandra rodiaei*, states that the alkaloid, heretofore known only as an amorphous substance, may be obtained in a crystalline form by treatment with methyl alcohol, but that other solvents, such as chloroform, reconvert it to an amorphous condition. On reduction by distillation with zinc-dust, bebeerine yields ortho-cresol; by oxidation with hydrogen dioxide it yields "oxybebeerine" ($C_{18}H_{21}NO_4$), which on treatment with sulphurous acid is reconverted into bebeerine. By the simple addition of methyl iodide and benzyl iodide, bebeerine is shown to be a tertiary base. Furthermore, the authors' investigations show that crystalline bebeerine from *Pareira brava* may exist in both the laevogyrate and dextrogyrate form, as well as in an optically inactive (racemic) form, and that both optically active forms may exist in the same plant, the one or the other predominating. These various forms also exhibit differing relations to solvents, the racemic form being the least soluble in all the solvents employed. The experiments of Dr. Hildebrandt, furthermore, show that the physiological activity of crystalline, dextrorotatory bebeerine is greater than that of the laevogyrate form, but that amorphous bebeerine, produced from the crystallized base, is decidedly more toxic than either of the crystallized forms. This leads to the inference that the crystallized modification is not absorbed as readily as is the amorphous base.—Pharm. Ztg., li, No. 76 (1906), 839.

Caffeine—New Compounds.—Brissemoret has prepared and describes three new saline compounds of caffeine, which are distinguished from the

ordinary caffeine salts by being permanent in air, and are not decomposed by water. If 10.50 Gm. caffeine and 7 Gm. salicylic acid are added to 1000 Cc. of boiling water, solution is instantly effected, and if rapidly cooled, white needles of

Caffeine Salicylate, $C_8H_{10}O_2N_4 \cdot C_7H_6O_3$, are deposited. This salt is difficultly soluble in cold water, more readily in hot water and in aqueous solutions of sodium acetate, and its aqueous solutions react acid to litmus. On adding the theoretical quantity of soda, the double salt of Tanret, $C_7H_5O_3Na \cdot C_8H_{10}O_2N_4 \cdot H_2O$, is produced, from which the caffeine may be completely extracted by chloroform.

Caffeine Protocatechuate, $C_8H_{10}O_2N_4 \cdot C_7H_6O_4$, is obtained similarly, using 10.50 Gm. caffeine and 7.60 Gm. protocatechuic acid. It is sparingly soluble in cold, more readily in hot water, and similar to the preceding in its behavior to alkali.

Caffeine Gallate, $C_8H_{10}O_2N_4 \cdot C_7H_6O_5$, is obtained in the same way, using 10.50 Gm. caffeine and 9 Gm. gallic acid. It forms gray, microscopic needles, but has similar characters in other respects to the two preceding salts.—Pharm. Ztg., li, No. 71 (1906), 737; from Bull. Soc. Chim., Paris, 35, 316.

Cinchona Alkaloids—Formation of Chlorine Addition-Products.—A Swedish investigator, who is not identified by name, has studied the action of chlorine upon the salts of cinchonine, cinchonidine and quinine, and finds that by shaking the three alkaloids in strong hydrochloric acid solution with definite quantities of gaseous chlorine, two atoms of Cl are assimilated with formation of basic chlorine addition products, the salts of which correspond to the dibrom addition products of these alkaloids, but possess greater stability. In distinction from cinchonine and cinchonidine, however, quinine is capable of assimilating more than 2 atoms of Cl. On boiling the dichlorides of these bases for a short time with alcoholic potassium hydroxide, they are converted into monochlor substitution products. If the alkaloids are dissolved in dilute H_2SO_4 and then shaken with chlorine, one half of the latter is converted into hydrochloric acid, and the chlorine addition products are produced only in inferior quantities.—Pharm. Ztg., li, No. 62 (1906), 687; from Vidensk Selsk Skrift, 7, 265.

Quinine—Reliable Determination as Herapathite.—The herapathite reaction as usually carried out by the original directions of Autenrieth fails to give reliable results because, as already pointed out by S. M. Jörgensen, there is the possibility of the formation of at least seven different quinine periodosulphates dependent on the proportions of the reagents employed, and these are not given with sufficient accuracy in Autenrieth's method to uniformly produce herapathite of the composition $4C_{20}H_{24}N_2O_2 \cdot 3H_2SO_4 \cdot 2H_2O$, as required. Høst Madsen therefore recommends the following method, which yields uniformly accurate results: The reagent is prepared

by dissolving 1 part of iodine in 1 part of 50 per cent. of hydriodic acid, 0.8 part of sulphuric acid, and 50 parts of 70 per cent. alcohol. If a few drops of this reagent are added to an alcoholic solution of quinine, herapathite crystals of the required composition will separate on standing for a short time. The reagent may conveniently be kept in stock.—Pharm. Ztg., lii (1907), No. 36, 372; from Ber. d. V. Pharm. Ges., 1906, No. 9.

Quinine—New Reactions.—C. Reichard describes several new quinine reactions. When heated with solution of KOH a green to yellow-green color is produced, which is considerably enhanced if the alkaloid has previously been mixed with a little α - or β -naphthol. The same reaction is produced if 25 per cent. hydrochloric acid is used in place of alkali, while when quinine is heated with concentrated H_2SO_4 it gives a transient blue color, and with HNO_3 a yellow to brownish or reddish color is developed, although it forms a colorless solution with (cold ? Rep.) nitric acid. A trituration of quinine and diphenylamine on addition of concentrated H_2SO_4 and on heating produces a permanent green color. Mixed with copper sulphate and moistened with water, quinine produces a green color, which is increased on addition of HCl. Mercuric chloride moistened with solution of KOH is reduced to a red-brown or black-brown mass on addition of quinine. With potassium iodate and water, quinine produces a green color, changing to yellow. Similar reactions are obtained with ammonium vanadate and with methylamine hydrochloride, while formaldehyde and sulphuric acid produce a blue-black color.—Pharm. Ztg., lii (1907), No. 12, 115; from Südd. Apoth.-Ztg., 1907, No. 4.

Quinine — Alkalinity Towards Phenolphthalein. — J. Larronturron demonstrates that the statement that quinine in aqueous solution is neutral to phenolphthalein is erroneous. Chemically pure quinine reacts alkaline towards phenolphthalein; the "pure" quinine of commerce often contains traces of basic sulphate, which, like all quinine salts, has an acid reaction towards phenolphthalein. By repeated washing of quinine a product is obtained whose solution does not react with barium salts, and distinctly colors phenolphthalein red. Pure quinine in aqueous solution is quickly decomposed under the influence of light, and gives at first a neutral and finally an acid reaction towards phenolphthalein, but when quite freshly prepared it decolorizes a colored solution of phenolphthalein. The author further shows that quinine, like all weak bases, is more weakly alkaline towards phenolphthalein than towards litmus. The acidity of quinine salts towards phenolphthalein increases with temperature and dilution.—Pharm. Journ., April 6, 1907, 433; from Zeit. Allgem. Oesterr. Apoth.-Ver., March 13, 1907.

Quinine Acetylsalicylate—Preparation and Characters.—L. Santi prepares a basic salt of quinine and acetylsalicylic acid as follows: Dissolve

378 Gm. quinine and 180 Gm. acetylsalicylic acid, each separately in sufficient ether, mix the two solutions, and set aside. The mixture becomes turbid immediately, and gradually deposits an oily fluid, from which eventually the basic salt separates in crystals, which are collected on a filter and dried. So obtained, basic quinine acetylsalicylate is a white salt, permanent in the air, melts at 157° C. without browning (as does quinine salicylate), and has a bitter taste. It is sparingly soluble in water (1:3000), more soluble in alcohol (2.5:700), readily soluble in chloroform (1:10), but insoluble in ether. A neutral salt was not obtainable by means of molecular quantities. It has proven a good antipyretic in the treatment of peritonitis and pleuritis in doses of 0.4 Gm.—*Pharm. Ztg.*, li, No. 75 (1906), 832; from *Bull. Chim. Farmac.*, Aug., 1906.

Quinine Arsenate—Preparation and Characters.—R. Lucius obtains quinine arsenate by dissolving 8 p. of quinine hydrochloride in 200 p. of warm water, adding with continuous stirring a solution of 3.1 p. of sodium arsenate in 100 p. of water, collecting the precipitated quinine arsenate after cooling on a filter and washing it with water until the washings cease to give more than a faint reaction for chloride. The precipitate is then recrystallized from its solution in 1000 p. of boiling water, collected on a filter and dried in the dark at 30° C. So obtained quinine arsenate forms shining, white, needle-shaped crystals, which effloresce slowly when exposed to air, are soluble in about 700 p. of cold water and 45 p. at the boiling point. When dried at 100° C., 1 Gm. of the salt should not lose more than 0.15 Gm. in weight.—*Pharm. Ztg.*, li, No. 61 (1906), 680; from *Thoms, Arb. aus d. Pharm. Inst. d. Univ. Berlin*, 1906.

Quinine Formates—Improved Method of Preparation.—Referring to the method of Lacroix (see *Proceedings*, 1906, 932) for obtaining neutral and basic quinine formates by the direct action of formic acid on the pure alkaloid, P. Guignes proposes a new method, which was suggested by a certain incompatibility observed in the behavior of quinine salts with ammonium acetate. If an aqueous solution of quinine sulphate obtained by the aid of formic acid is neutralized with dilute ammonia, the liquid is converted into a crystalline mass, even before complete neutralization is effected. If, on the other hand, a solution of quinine in an excess of diluted formic acid is neutralized with dilute ammonia, and concentrated on a water-bath,

Neutral Quinine Formate, $C_{20}H_{24}O_2N_2 \cdot 2CH_2O_2$, which is readily soluble in water, is obtained. This melts below 100° C., losing a portion of formic acid. Again, if quinine is dissolved in the cold in the quantity of formic acid just necessary for solution, and the liquid is then treated with a neutral, concentrated solution of ammonium formate,

Basic Quinine Formate, $C_{20}H_{24}O_2N_2 \cdot CH_2O_2$, is obtained in the form of crystals, which are stable in air, do not melt at 100° C., and are soluble in

less than 20 parts of water.—Pharm. Ztg., li, No. 98 (1906), 1083; from Journ. de Pharm. et Chim., 1906, No. 7.

Quinine Sulphate.—*Solubility in the Presence of Phenazone Citrate*.—Having observed that a permanent solution was obtainable by omitting the hydrochloric acid in a prescription of quinine sulph., 3ss, caffeine citrate, 3ss, phenazone, 3i, dilute hydrochloric acid, 3ss, water to make 3vj, Thomas Dunlap made a number of experiments which led to the conclusion that the solvent effect, in the absence of the HCl, is due to phenazone citrate formed by the reacting ingredients. Clear solutions are obtainable at first with the quinine salt and citric acid alone in the same proportions, or with caffeine citrate alone, but in both cases crystallizations manifest themselves after standing for several hours. With phenazone alone, no solution results, but a permanently clear solution is effected on the further addition of citric acid in the proportions in which it is present in the caffeine citrate of the original prescription.—Pharm. Journ., Aug. 4, 1906, 144.

Cocaine.—*Commercial Quality*.—In a paper recording a comprehensive series of investigations concerning the characters, qualities and tests for cocaine, undertaken with the particular object of pointing out the deficiency in the requirements of the Russian Pharmacopœia of 1902, W. K. Schulz mentions that the supply of cocaine preparations in Russia is almost completely the product of four German manufacturers. He has subjected the cocaine salts of these firms to rigid examination, and finds not alone that they are indistinguishable from each other in their physical properties, but that in their chemical characters they respond fully to the requirements of the Germ. Pharm. IV, even exceeding the requirement in so far as accompanying foreign alkaloids (isatropyl-cocaine, cinnamyl-cocaine) are concerned. Regarding the tests for cocaine the author emphasizes the value and importance of MacLagan's reaction for the quality determination, and insists on its adoption in future editions of the Russian Pharmacopœia.—Pharm. Ztg., lii, (1907) No. 43, 447; from Pharm. Ztschr. f. Russl., 1907, 165.

Cocaine.—*Identification*.—The property of pure dry cocaine to undergo decomposition by simple attrition, with the formation of benzoic acid methyl ester, is suggested by C. Reichard for its identification. He finds that if crystals of the pure alkaloid are subjected to trituration, the strong aromatic odor of the methyl benzoate quickly manifests itself.—Pharm. Centralh., xlvii, No. 45 (1906), 925.

Cocaine.—*New Reactions*.—C. Reichard describes several new reactions for cocaine, the following being quite characteristic: A small quantity of alpha-naphthol is dissolved in 40 per cent. solution of potassium hydrate, added drop by drop until solution is effected and with careful avoidance of heat. A small crystal of cocaine hydrochloride is then placed in the

center of the solution, whereupon a bluish color is developed on the margins of the crystals and gradually increases to a deep dark-blue, which has considerable permanence, and may be preserved unchanged for a long period if it is absorbed by a piece of filter-paper and permitted to dry spontaneously. The color reaction is unaccompanied by a rise in temperature. Another new reaction, which is more general in its character, depends on the development of a deep carmine-red color when a crystal of cocaine hydrochloride is placed upon a moistened strip of Brazilwood test-paper. The latter is prepared by saturating filter-paper with an alcoholic tincture of Brazil wood (*Caesalpinia echinata*, L.) and allowing it to dry spontaneously, when it assumes a leather-brown color, and may be preserved permanently unchanged. The same, or similar, reaction is, however, produced by other compounds, particularly those of the alkalies and of the organic bases.—Pharm. Ztg., li, No. 53 (1906), 591-592.

Cocaine Hydrochloride—Included Water Cause of Decomposition.—P. Breteau observes that since cocaine hydrochloride is no longer supplied in the form of small laminæ, it is seldom observed in a partly decomposed condition. In this form the salt always retained some water with great persistency, and the presence of this sufficed to cause its decomposition, resulting in the formation of benzoic acid, benzoic-acid methylester and ecgonine hydrochloride.—Pharm. Ztg., li, No. 61 (1906), 680; from Journ. de Pharm. et Chim., xxiii (6), No. 10.

Ergotinine and Ergotoxine—Characterization.—G. Barger and F. H. Carr have reinvestigated the crystalline alkaloid ergotinine which was obtained from ergot by Tanret more than thirty years ago, and also the non-crystalline obtained by Tanret from the ethereal mother-liquors, and termed by him "amorphous ergotinine," the latter being probably identical with the "cornutin," since described by Kobert. The present investigators have redetermined the analytical figures given by Tanret for

Ergotinine.—While confirming those given for C and H, they find 11.7 per cent. instead of 9 per cent. of N, and, without as yet definitely assigning a formula for this base, they suggest $C_{28}H_{22}O_4N_4 = 488$, as probably representing its true composition. Ergotinine apparently contains no phenolic hydroxyl and no methoxyl group. It is probable that there is a methyl group attached to one of the nitrogen atoms. Regarding the second, amorphous alkaloid, the authors have now obtained it in a state of chemical purity, and suggest for it the name

Ergotoxine.—Though itself amorphous it forms a number of crystalline salts. The oxalate crystallizes from alcohol in minute prisms, mostly arranged in rosettes; the tartrate forms prisms; the phosphate fine needles, frequently grouped in sphaeriles. Unlike ergotinine, ergotoxine readily dissolves in aqueous caustic soda and gives a benzoyl derivative by the Schotten-Bauman method; it probably contains a phenolic

hydroxyl. Analytical data point to a formula differing but slightly from that of ergotinine.

Both alkaloids give strongly fluorescent solutions, and give with sulphuric acid and ferric chloride the play of colors originally described by Keller as characteristic of ergotanine. Physiological experiments, made by H. H. Dale prove ergotoxine to be the essential active principle of ergot, the typical effects of the drug being produced by a few milligrams of this alkaloid; whereas pure crystalline ergotinine is physiologically almost or quite inactive.—Pharm. Journ., Sept. 1, 1906, 257.

Clavin—Preparation and Properties.—Professor E. Vahlen contributes further information concerning the interesting body, clavin, which he has succeeded in isolating from ergot (see Proceedings, 1906, 690 *), and which he regards as being the only pharmacologically active constituent of the drug that has so far been successfully characterized as a chemical individual. To obtain clavin, the aqueous extraction from 500 Gm. of ergot is evaporated to dryness, the dry residue is extracted with 500 Cc. of alcohol of 70 per cent. (by volume), and the hot filtered solution allowed to cool. The clavin is thus deposited in form of delicate needles, which are partially embedded in a brown, smeary mass, from which it is freed and purified by suction, and repeated crystallization from pure alcohol—the yield being a few grammes from a kilogramme of ergot. Clavin is readily soluble in water, almost insoluble in cold absolute alcohol and very sparingly even in hot, but more soluble in ordinary alcohol its solubility being increased in properties to the dilution of the solvent, and it is quite insoluble in ether, acetic ether, and petroleum ether. Its aqueous solution is neutral and it is not precipitated from such either by alkalis or their carbonates. Its composition corresponds to the empirical formula $C_{11}H_{22}N_2O_4$. It melts in a sealed capillary tube at 262° – 263° C., but is decomposed when carefully heated in a dry test tube without previously melting, giving off an odor reminding of burning horn, and a dense cloudy vapor which condenses as a sublimate on the colder part of the tube in the form of microscopic prisms. It is readily split up into two distinct acid bodies, both containing nitrogen, sublimable, and less soluble in water than clavin.—Pharm. Ztg., li, No. 60 (1906) 668.

Hydrastinine Bitartrate—Medicinal Use and Dosage.—According to Ed. Béguin, hydrastinine bitartrate forms crystalline needles which are very soluble in water, and is recommended in doses of 0.03 to 0.06 Gm. as a hemostatic.—Schweiz. Wschr. f. Chem. u. Pharm., xlv, No. 41 (1906), 692.

Opium Alkaloids—Action of Hydrogen Peroxide.—Prof. Freund has determined that when thebaine is oxidized with hydrogen peroxide a base

* Owing to a typographical error, this is indicated by the name "Clasin" under New Remedies on p. 690, Proceedings 1906.

having the formula $C_{19}H_{21}NO_4$ is obtained, which forms a crystalline hydrochloride, melting-point $238^{\circ}C.$ to $239^{\circ}C.$ It is reconverted into thebaine by reduction with sulphurous acid. Morphine, under similar conditions, furnishes the crystalline base oxymorphine, $C_{17}H_{19}NO_4$, melting-point $274^{\circ}C.$ to $275^{\circ}C.$; it forms a crystalline nitrate, $C_{17}H_{19}NO_4 \cdot HNO_3$, melting-point $206^{\circ}C.$ to $208^{\circ}C.$ Oxycodine, obtained from codeine in the same way, $C_{18}H_{21}NO_4$, forms tablets, melting-point $230^{\circ}C.$ to $231^{\circ}C.$; its hydrobromide melts at $174^{\circ}C.$ to $175^{\circ}C.$ Dionine gives oxydionine, $C_{19}H_{23}NO_4$, crystallizing in needles, melting-point $220^{\circ}C.$ to $221^{\circ}C.$, and forms crystalline salts.—Apoth. Ztg., xxi (1906), No. 98, 1050; from Chem. Ztg., 1906, 1207.

Cotarnine—Melting-Point.—D. B. Dott has prepared cotarnine by oxidizing narcotine both by means of nitric acid and with manganese dioxide and sulphuric acid, and purifying his products by several crystallizations from benzene. In both cases the cotarnine melted at $125^{\circ}C.$ with apparent decomposition, while if it is heated for some time on a watch-glass at $100^{\circ}C.$ it darkens in color and gradually melts completely, evidently also under decomposition. The melting-point has been given by the older authorities at $100^{\circ}C.$, while more recent books give it at $132^{\circ}C.$ —Pharm. Journ., Jan. 26, 1907, 78.

Morphine—Solubility and Melting-Point.—Edward J. Guild observes that the solubility of morphine in water has been greatly overstated by many observers, and expresses the opinion that this is most probably due to the presence of traces of codeine. Having carefully purified morphine by a process which he describes in detail, which excludes the presence of codeine, he has redetermined its solubility in water and obtained figures which point to 1 in 5200 as being very near the actual solubility of hydrated morphine in water at $20^{\circ}C.$, figures which agree very closely with those of Ladenburg, who gives 1 in 5000 (temperature not stated). The question of the melting-point of morphine was also taken into experimental consideration, the general statements concerning this being quite unsatisfactory. For this determination the morphine was dried at $110^{\circ}C.$ for three hours to render it anhydrous. There was no change until the temperature reached $225^{\circ}C.$; incipient decomposition was observed between 225° and $228^{\circ}C.$; at $235^{\circ}C.$ it was distinctly brown, and between 245° and $250^{\circ}C.$ it became apparently completely decomposed, being fused and sublimed as a dark-brown tar on the sides of the capillary tube, without, however, suffering any diminution in weight.—Pharm. Journ., March 23, 1907, 357.

Morphine—Colorimetric Method of Determination.—Georges and Gascard propose a colorimetric method for the determination of morphine, which depends on the tint produced in a neutral or very faintly acid solution of morphine with iodic acid and the subsequent addition of ammonia.

The tint obtained with solutions of 1:500 to 1:5000 can be readily measured in a colorimeter compared with that given under similar conditions by a standard solution of morphine. The reagents required are: (1) A solution of morphine hydrochloride 1.256 Gm. in 1 liter; each Cc. of this is equivalent to 0.001 Gm. of $C_{17}H_{19}NO_3 \cdot H_2O$. (2) A 5 per cent. solution of iodic acid. (3) A 10 per cent. solution of ammonia. For the colorimetric determination 5, 10, or 20 Cc. of the morphine solution of unknown strength is treated in one series of tubes with 5 Cc. of the iodic acid reagent, and rendered alkaline with ammonia. The standard solution is treated in a similar manner in the other tubes and a reading is taken with the colorimeter in the usual manner.—Pharm. Journ., July 21, 1906, 53; from Journ. de Pharm. et Chim., 1906, 23, 513.

Morphine—Sensitive Colorimetric Method of Determination.—C. Mai and C. Rath recommend the following simple and sensitive colorimetric test for the estimation of morphine, which is dependent on the deep violet color produced in its solutions by a mixture of 2 drops of 40 per cent. formaldehyde solution with 3 Cc. of sulphuric acid, commonly known as "Marquis' Reagent." Place 1 Cc. of an aqueous solution of morphine hydrochloride (1:1000) into a deep glass capsule, evaporate it to dryness on a water-bath, and stir the residue with 1 Cc. of the formaldehyde-sulphuric acid mixture. Then transfer the deep violet colored solution to a small tube (about 10 Mm. diameter) and dilute it with 4 Cc. of sulphuric acid, using a portion of the acid for rinsing the capsule. With the quantity of morphine hydrochloride used in the experiment (1 Mgm.), an intensely deep, almost opaque, violet-blue liquid is thus produced, while with smaller quantities the intensity of color diminishes in gradations which are well adapted for colorimetric estimations. The limit is possibly reached with 0.00003 Gm. of morphine, which quantity still gives a distinct and comparable blue coloration; while still smaller quantities may serve for qualitative recognition, although no longer available for quantitative comparison. Arch. d. Pharm., 244, No. 4 (1906), 300.

Narceine—Distinctive Reactions from Other Opium Alkaloids.—C. Reichard finds that beside the ready solubility in water and its insolubility in ether, the following reactions serve to distinguish narceine from the other opium alkaloids: Concentrated H_2SO_4 produces an immediate greenish-yellow color, later darkening somewhat, but soon paling again; if the mixture is then carefully heated, it develops a blood-red to brown-red color. With hydrochloric acid it produces a permanently colorless solution. If an aqueous solution of mercuric chloride and narceine is evaporated to dryness, a little hydrochloric acid added, and again evaporated to dryness, the addition of a drop of concentrated sulphuric acid to the dry residue produces a characteristic yellow coloration. A concentrated solution of bismuth trichloride acquires an intensely yellow

color on addition of narceine; but a particularly characteristic color reaction is that produced when narceine is added to a concentrated solution of stannous chloride, followed by solution of KOH, and then warmed. The dry residue of evaporation acquires a yellow to greenish-yellow color, which at a higher temperature becomes black-green. Another characteristic reaction is the dark blue color developed on the addition of a drop of concentrated H_2SO_4 to a mixture of narceine and ammonium heptamolybdate.—Pharm. Centralh., xxvii, Nos. 50 and 51 (1906), 1028 and 1048.

Narcotine—Reactions.—C. Reichard describes a long series of reactions obtained with narcotine. It forms a colorless solution with concentrated sulphuric acid as well as with 25 per cent. HCl. In the presence of sulphuric acid, mercurous nitrate immediately gives a deep black color with the alkaloid, changing later to yellow-red. If a mixture of narcotine, sodium arsenate and sulphuric acid, is very cautiously heated, characteristic red and violet colorations, analogous to morphine, are developed. Stannous chloride produces a similar reaction. On adding narcotine to concentrated solution of potassium ferricyanide, followed by HCl, a green residue is produced on drying, which later changes to blue. Potassium ferrocyanide does not produce this reaction.—Pharm. Centralh., xlviii (1907), No. 3, 44.

Pilocarpine—Characteristic Reactions.—C. Reichard mentions as physical characters of distinguishing pilocarpine the liquidity of the free alkaloid, the hygroscopic property of the hydrochloride, and the insolubility of the nitrate in cold, absolute alcohol. Characteristic color reactions are obtained as follows: A magnificent blue color, remaining for about an hour if a fragment of pilocarpine hydrochloride is brought in contact with a drop of concentrated sulphuric acid, while with nitric acid no reaction whatever is manifested. A light-green color, retained for several weeks, is developed on the edges of the reacting material if pilocarpine is heated to dryness with a little cupric sulphate and a drop of water. A gray to deep black residue, remaining so for many days, if a crystal of the pilocarpine salt is gently warmed with a drop of solution of antimony trichloride, while under the same conditions, using sodium arsenate and hydrochloric acid, a dirty yellow residue is obtained. A very characteristic reaction is obtained if a crystal of pilocarpine hydrochloride and of potassium ferrocyanide are covered with a drop of water. The latter at once assumes an intense yellow color, and on drying a yellow residue remains.—Pharm. Centralh., xlviii (1907), No. 21, 417.

Papaverine—Color Reactions.—C. Reichard describes a large number of color reactions of papaverine with different reagents—sulphuric acid, nitric acid, KOH, methylamine hydrochloride, o-sodium arsenate, ammonium vanadate, mercuric salts, etc., etc.—which may prove of some value or analytical purposes, but can be profitably consulted only in the original paper, in Pharm. Centralh., xlvii (1907), Nos. 16 and 17, 313 and 334.

Protopine—a constituent of Chinese (and Japanese) corydalis tubers. See *Corydalis cava*, under "Materia Medica."

Solanine.—Investigations concerning its increase during the storage or disease of *potatoes*, which see under "Materia Medica."

Strychnine—Colloidal Modification.—O. H. Brown describes a colloidal modification of strychnine, obtained by mixing hydrogen dioxide, albumen and strychnine, and allowing the mixture to stand six weeks. The originally thin liquid, aqueous fluid is thus converted into a gelatinous mass, or deposits a flocculent precipitate, with, presumably, the formation of a compound of albumin and strychnine. Administered subcutaneously to rabbits in doses corresponding to 20 times the lethal dose of pure strychnine, the gelatinous strychnine compound exerted no toxic action, while its administration per os produced death within 3 hours. It follows that the strychnine has not been oxidized by the action of the H_2O_2 present in the original mixture.—Pharm. Ztg., li, No. 89 (1906). 987; from Chem. C.-Bl., 1906, ii, No. 17.

Strychnine—Modification of the U. S. P. (Nitric Acid) Process for Its Determination.—Experiments made by E. H. Farr and R. Wright at the time of the publication of the U. S. P., VIII, showed that, notwithstanding the condemnation of the nitric acid process for the determination of strychnine by several analysts in England, it gives perfectly accurate and satisfactory results, if some slight modifications of the working details are followed. The exact details of the process as applied by the authors are given as follows: The total alkaloids obtained in the usual way from 5 Cc. of the liquid extract, or 25 Cc. of the tincture, are dissolved by the heat of a water-bath in 15 Cc. 3 per cent. sulphuric acid, the temperature of the solution adjusted to 50°C. , 3 Cc. of a mixture of equal volumes nitric acid (sp. gr. 1.42) and water added, and the mixture set aside for ten minutes. It is then transferred to a separator, 50 Cc. solution of potash, B. P., and 10 Cc. of chloroform added, and the mixture well shaken. After separation, the chloroform is run into a tared dish containing 3 Cc. amyl alcohol, and the agitation repeated with two further portions of 5 Cc. chloroform. The dish is placed in a current of warm air, to allow the chloroform to evaporate, and the final evaporation and drying completed over a water-bath. The strychnine is sometimes obtained in fine perfectly white crystals, but is usually slightly tinted.—Trans. Brit. Pharm. Conf. (Year-book of Pharm.), 1906, 226–229.

Theobromine—Analysis of Compounds Recommended as Diuretics.—Theobromine is used as a diuretic, and is considered superior to caffeine on account of its relatively slight action on the central nervous system; but, as it is only sparingly soluble in water, and its combination with sodium hydroxide is so alkaline that it is unsuitable as a therapeutic agent, various attempts have been made to produce soluble compounds suitable

for administration. Dr. F. Zernik has published the results of his analyses of a number of these compounds. *Agurin* is a compound of theobromine soda and sodium acetate, containing 58.1 per cent. of theobromine; *diuretin* is a combination of theobromine soda with sodium salicylate, containing 49.7 per cent. of theobromine; *barutin* is prepared from theobromine, baryta, and sodium salicylate, and contains 25.5 per cent. of theobromine; *theobromose* is composed of theobromine and lithium; *urocitra* is prepared with theobromine soda and sodium citrate, and contains 52.2 per cent. of theobromine; *uropherin* is a compound of theobromine and lithium, with lithium benzoate or salicylate; *theophorin*, the latest of these bodies, is a compound of theobromine soda and formic acid, containing 62.5 per cent. of theobromine, and experiments show that it combines the diuretic properties of theobromine with the tonic properties of sodium formate. It is given in doses of 15 grains three times daily.—Pharm. Journ., Feb. 9, 1907, 293; from Lancet, March 2, 1907.

Strychnine.—Effectual method of separation from brucine by a modification of the U. S. P. method of assaying *Nux Vomica*, which see under "Materia Medica."

Theobromine—Curious Reaction.—G. Gérard mentions the following curious reaction of theobromine which does not appear to have been previously recorded: If 0.050 Gm. of theobromine, 3 Cc. of water and 6 Cc. of solution of caustic soda, sp. gr. 1.332, are mixed, set aside for a few instants, and then treated with 1 Cc. of solution of ammonia and 1 Cc. of 10 per cent. solution of silver nitrate, the liquid when shaken assumes the form of a colorless gelatinous mass, imprisoning bubbles of air. If the tube be plunged in water and heated, this jelly melts at 60° C. and recongeals on cooling. It may be kept for some weeks, if protected from light. If too quickly heated the gelatinous compound becomes dark-colored. The sensitiveness of the reaction is considerable, since an evident solidification of 10 Cc. of liquid is obtained when using only 0.010 Gm. of theobromine. Caffeine, under similar conditions, gives no such result.—Pharm. Journ., July 21, 1906, 53; from Journ. de Pharm. et Chim., 1906, 23, 476.

Tobacco Alkaloids.—Isolation and characters of several new bases. See *Tobacco* under "Materia Medica."

Acetanilid and Phenacetin—Determination in Pharmaceutical Preparations.—Joseph L. Turner and Charles E. Vanderkleed find among the different methods for the determination of acetanilide (or phenacetin) the one depending on the saponification of the acetanilide by means of an alkali, distillation of acetic acid from the resulting acetate from an acidulation, and titration of the distillate, to be the most convenient for use in the analytical laboratory. The method can be applied to the most complicated pharmaceutical mixtures, it being necessary, in general, only to extract the mixture with chloroform or alcohol in order to obtain the acetanilide in a state

of sufficient purity for the saponification. The details of the method may be explained in brevity as follows: 1 Gm. of acetanilide is saponified by heating to boiling, under a reflux condenser, for one and a half to two hours with 3 Gm. sodium hydroxide, 20 Cc. alcohol, and 10 Cc. water, evaporating the alcohol from the solution, and shaking out the aqueous residue once with ether to remove the aniline split off from the acetanilide. To recover traces of sodium acetate, which is somewhat soluble in ether, the ethereal solution is washed twice with water, and the washings are added to the original aqueous solution. This is then transferred to a liter-flask, acidified with 25 Cc. of 85 per cent. phosphoric acid, and the acetic acid liberated is distilled off with steam, until the distillate passing no longer reacts acid. The distillate is then titrated with $\frac{1}{2}$ N sodium hydroxide, using phenolphthalein as indicator—1 Cc. of $\frac{1}{2}$ N sodium hydroxide being equivalent to 0.13409 Gm. acetanilide (or 0.17779 Gm. phenacetin). The simultaneous method of acetanilide and phenacetin, or of other acetylated compounds in the same preparation would, of course, prevent the use of the method, which is applicable to phenacetin alone without modification.—Amer. Journ. Pharm., April, 1907, 151-156.

Antipyrine—Quantitative Estimation as Picrate.—According to J. D. Riedel's Berichten, 1907, antipyrine may be conveniently determined quantitatively by taking advantage of the insolubility of its picrate. About 0.5 Gm. of antipyrine (or its equivalent if in admixture) is dissolved in 50 Cc. of water, 5-6 Cc. of normal hydrochloric acid added, and heated to boiling; the hot solution is then well mixed with about 10 Cc. of a cold-saturated alcoholic solution of picric acid and set aside. Antipyrine picrate soon begins to form in long handsome needles, which after several hours are quantitatively and completely separated. They are collected on a suction filter, washed, dried at 90°-95° C., and weighed.—Pharm. Ztg., lii, No. 28 (1907), 290.

Phenazone—Origin as a Synonym for Antipyrine.—Alexander Gunn mentions that when the B. P. of 1898 was published, "antipyrine" had already come into such universal use, not only as a prescribed article, but as a household remedy, that its appearance in the guise of "phenazone" almost obscured its identity. The change to the latter name was necessary on account of the undesirability of introducing the name of a protected article into the Pharmacopœia; but, the antipyrine patent having expired (in February, 1898), the question arises, should the name "phenazone" be now readopted. It is not meant to suggest that "phenazone" is not a suitable trivial name; on the contrary, it would be almost impossible to devise a better, but the tendency even now is to think of "phenazone" in terms of "antipyrine." Moreover, there is another reason for bringing the question forward, namely, that the name "phenazone" has for several years past been in use for "diphenylenazone," a substance altogether distinct from antipyrine. Tracing up the history of the term,

Mr. Gunn finds that the word "phenazone" was suggested as a convenient short name for "diphenylenazone," in December, 1891, by Ernst Täuber (Berichte, 24, 3883), and was subsequently adopted by L. Meyer, Jr., by von Richter, and numerous others, as a synonym for the same substance. Understanding that Dr. Attfield was the author of the name "phenazone" in the official (B. P.) sense, Mr. Gunn has now received the statement from him that he had brought this word before the Pharmacopœia Committee on July 7, 1890, thus disposing of any uncertainty as to the authorship of the term. Nevertheless, in view of the wide use of the term "phenazone," in standard chemical books, as the equivalent of "diphenylenazone," it would appear to be advisable to revert to the term "antipyrene," so as to avoid possible confusion, the more particularly since this name has been adopted for the medicinal "phenyl-dimethyl-iso-pyrazolone" in the U. S. P., VIII.—Pharm Journ., July 7, 1906, 6.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Arbutin.—Characteristic color reaction with *Nitric Acid*, which see under "Inorganic Acid."

Arbutin.—Micro-chemical determination in *Uva Ursi*, which see under "Materia Medica."

Cyanogenetic Glucosides.—*Micro-chemical Method of Detection*.—M. Greshoff, as the result of numerous experiments, recommends the following method for the detection of cyanogenetic glucosides: Prepare a thin section containing at least one layer of intact cells, immerse it immediately in a 5 per cent. alcoholic solution of potash for fifteen to thirty seconds, transfer it to a solution containing 2.5 per cent. of ferrous sulphate and 1 per cent. of ferric chloride for ten minutes at 60° C.; then remove it to dilute hydrochloric acid (1 to 6), where it should remain for five to fifteen minutes. The distribution of the Prussian blue produced can then be studied. The paper also contains a list of the cyanogenetic glucosides known, and of the plants which have been found to contain such glucosides.—Pharm. Journ., Feb. 2, 1907, 107; from Bull. des Sci. Pharm., 13, 589.

Digitalis Glucosides.—*A New Reagent*.—Brissemoret and Derrien describe a new reagent for distinguishing between the different digitalis glucosides. It consists, on the one hand, of a mixture of 3 Cc. of acetic acid and 2 Cc. of a 4 per cent. oxalic acid solution which is reduced to neutralization by means of sodium amalgam, and, on the other, 5 Cc. of sulphuric acid. The glucoside under examination is dissolved in the first named mixture and then superimposed on the sulphuric acid. In the case of *crystallized digitalin* a green color develops at the zone of contact; with *digitalein* a carmine color, free from the brown edges observed with Kiliani's reagent, while *digitonin* does not react at all.—Pharm. Ztg., lii

(1907) No. 36, 374; from Bull. gén. de Therap., 1907, 382, through Chem.-Ztg. Rep. 31.

Elaterin—Chemistry and Composition.—According to the investigations of A. Berg the formula for elaterin, based upon its molecular weight and more recent elementary analyses, should be given as $C_{28}H_{38}O_7$, and not, as proposed by Zwenger, $C_{20}H_{28}O_5$. Elaterin forms a diacetyl derivative, is split by alcoholic KOH into acetic acid and amorphous elateridin, insoluble in alkalies, and is by the continued action of KOH converted into elaterinic acid.—Pharm. Ztg., li, No. 71 (1906), 788; from Bull. Soc. Chim., de Paris, 435, through Chem. Centralbl., 1906, ii, No. 7.

Elaterin—Chemistry and Composition.—At the 78th Annual Convention of German Naturalists and Physicians (Sept., 1906), Dr. H. Thoms communicated the results of an investigation into the chemistry of elaterin, undertaken by Adolf Mann at his suggestion with the object of clearing up the conflicting statements of Zwenger and of Berg concerning its elementary composition and chemical constitution. These results are of particular interest in view of the acceptance in the U. S. P. of Zwenger's formula ($C_{20}H_{28}O_5$) and melting-point ($216^\circ \text{C.} = 420.8^\circ \text{F.}$) for pure elaterin, since they point out that neither Zwenger's nor Berg's more recent formula conform to the actual elementary composition. Mr. Mann's elementary analysis and the determination of the congealing point, leads to the formula $C_{22}H_{30}O_6$, and a melting-point of 232°C. On boiling elaterin with $\frac{N}{10}$ KOH and titrating the excess, it was determined that 1 mol. of elaterin requires 2 mol. KOH for complete combination. Alcoholic or hydro-alcoholic solutions of elaterin have a perfectly neutral reaction. On addition of KOH, the alkaline reaction initially produced disappears after some time on heating, and reappears on again adding alkali. This behavior with KOH leads to the assumption that elaterin contains two lactone rings. It reacts with ammonia and with ethylamine, and the ammonium compound produced gives the biuret reaction. The formation of an osazone shows the presence of a carbonyl group, which exists in form of an aldehyde group, while further results of the present investigation, which is not yet completed, make it very probable that the chemical constitution of elaterin rests upon a naphthalene nucleus.—Pharm. Ztg., li, No. 76 (1906), 837.

Glycyrrhizin—Chemistry.—According to A. Tschirch and H. Cederberg, who are engaged in an investigation of the chemical constituents of licorice root, glycyrrhizin consists of the calcium and potassium salts of glycyrrhizinic acid, which contains no nitrogen, having the empirical formula, $C_{44}H_{64}O_{19}$. As indicated by the constitutional formula,

Glycyrrhizinic Acid is a tribasic acid. It was not obtainable in a crystalline condition direct, but when liberated from the crystalline monopotassic salt, and purified by a prolonged process, it was ultimately obtained in colorless prisms which melted near 205°C. The

Mono-Potassium Glycyrrhizinate, $KC_{44}H_{88}O_{19}$, occurs in colorless, intensely sweet crystals, which impart a distinct taste to water in a dilution of 1 : 20,000. It is soluble in hot water, the solution setting to a jelly on cooling. The solution is colored yellow by alkalis. It may be titrated with alkali, using phenolphthalein as indicator. It is optically inactive, is precipitated by basic and normal lead acetate; since it contains six hydroxyl groups it gives the hexa-acetyl compound, $C_{44}H_{88}O_{19}(CH_3CO_6)$, when acetylated, m. p., $210^{\circ}C$. The acid does not reduce Fehling's Solution nor ammoniacal silver nitrate reagent. The

Neutral Potassium Glycyrrhizinate, $K_3C_{44}H_{88}O_{19}$, has not been obtained in a crystalline condition, but as a white, amorphous powder, by saturating the alcoholic solution with KOH.

Although resembling a glucoside, glycyrrhizinic acid is not truly such, since on hydrolysis it takes up two molecules of water, forming *glycyrrhetic acid* and two molecules of *glycuronic acid*; and, therefore, the "diglycuronic ester of glycyrrhetic acid."

Glycyrrhetic Acid was obtained in the form of small, colorless, tasteless needles, m. p. about $210^{\circ}C$. It forms a diacetyl as the above formula indicates. After separating glycyrrhetic acid, glycuronic acid is obtained as the phenylhydrazine compound, m. p. $215^{\circ}C$. The free acid forms a colorless syrup which slowly deposits small hard crystals; it has the formula $2(C_6H_{10}O_7)$. It reduces Fehling's Solution. With regard to the

Glucose which is associated in the drug with glycyrrhizin, the authors, in view of the close relation of glycuronic acid to glucose, they consider it possible that this carbohydrate stands in a genetic relation to the acid.—Arch. d. Pharm., 245, No. 7 (1907), 97-111.

Glucosides of Ipomæa Turpethum—Characters, Etc.—Votocek and Kastner find that turpeth root (*Ipomæa turpethum*) contains besides a resin insoluble in ether, the so-called "turpethin," a second resin, soluble in ether, which is a glucosidal body to which they have given the name

Turpethin.—This however, is not a single body, but consists of two glucosides, "*α*-turpethin," which is readily soluble in petroleum ether, and *β*-turpethin, which is difficultly soluble in petroleum ether.

α-Turpethin yields on hydrolysis a non-volatile fatty oxyacid, $C_{16}H_{32}O_8$, which is isomeric or identical with jalapric acid, ipomeolic acid and tampicollic acid, together with a volatile fatty acid, probably valerianic, and rhamnose.

β-Turpethin also yields on hydrolysis a non-volatile and a volatile higher fatty acid, together with two sugars—rhodose and glucose.—Pharm. Ztg., lii (1907) No. 29, 302; from Böhm. Ztschr. f. Zuckerindustr. through Chem. C.-Bl., 1907, i, No. 13.

Ouabain—Amorphous Form.—L. Lewin has isolated an amorphous

form of ouabain from the wood of *Acocanthera Schimperii*, which he finds to be identical with crystalline ouabain in all respects, chemically as well as toxicologically, with the exception that it is amorphous.—Pharm. Ztg., li, No. 97 (1906), 1094; from D. Med.-Ztg., 1906, No. 94.

Thoms calls attention to the fact that the so-called "Ouabain" which has been isolated by Lewin from *Acocanthera Schimperii*, is identical with "Strophanthin"—Berl. Klin. Wchr., 1907, No. 4.

Oxymethylantrâquinones—Microchemical Demonstration in Emodin-Drugs.—W. Milacher recommends for the microchemical characterization of certain emodin-drugs, such as cortex frangulæ, cort. cascar. sagradæ, rad. rhei and fol. sennæ, the demonstration of the oxymethylantrâquinones by the following method: A small quantity of the powdered drug is slowly heated in a watch glass, over a micro-burner or on a sand bath, and the vapor evolved is collected on broad object glass. In the sublimate so obtained from frangula or rhubarb, copious yellow crystalline needles and lance-shaped crystals (of a length to over 1 Mm.) are usually recognized. They are double refractive, and dissolve in alcohol, benzol, chloroform, ether, toluol, and acetic acid. In alcoholic KOH they dissolve at once with a deep red color, but with aqueous KOH they disintegrate gradually, eventually producing also a deep red solution. In soda a portion only of the sublimate is soluble with a red-brown color. The crystals are accompanied by yellow crystalline clods, which exhibit the same reactions. If, for any reason (for example by overheating), the crystallinity of the sublimate is indistinct, handsome crystals may usually be secured by resublimation. In the case of cascara and senna irregularly crystallized yellow sublimates (in the case of senna, ball-shaped) are mostly obtained, which, however, exhibit the same reactions as the sublimates from the two first named drugs. Moreover, by resublimation, these irregular masses will also yield well-defined needles.—Pharm. Ztg., li, No. 98 (1906), 1084; from Pharm. Post., No. 46, 1906.

Rhamnosides—Chemical Identity and Relations of Various Kinds.—Dr. Ernest Schmidt communicates the results of the studies of Wunderlich concerning the chemical identity and relations of various rhamnosides. The studies of Waliaschko and of Braun have already established the identity of *rutin*, the rhamnoside of *Ruta graveolens*, with the rhamnoside *sophorin*, from the flowering buds of *Sophora japonica* (see Proceedings 1904, 955-956). Wunderlich now finds that the same is true of *viola quercitrin*, from the flowers of *Viola tricolor*, which is identical with the rhamnoside from the flowers of the buckwheat (*Fagopyrum*). He finds, furthermore, that while *capér-rutin*, from commercial capers, corresponds in all other respects with the rutin of *Ruta graveolens*, it still shows a slight variation in the softening point, notwithstanding repeated and careful purification. On the other hand, he finds the acetyl derivatives of rutin and

of caper-rutin to possess identical properties and melting-points. Concerning the *saponin* of quillaia bark, the author finds that, independent of other characters of distinction, and in conformity with other saponins, its product of hydrolysis bears no relation to those of the rutins. While the latter yield as products of hydrolysis rhamnose and dextrose, he succeeded in obtaining from the hydrolytic products of quillaia-saponin well crystallized galactose, which was identified by its melting-point, its osazone, and its conversion into mucic acid. Of the pentasoses accompanying the galactose, none have so far been isolated in a crystalline condition.—Pharm. Ztg., li, No. 77 (1906), 849.

Rottlerin—Chemical Constitution and Relation.—Dr. H. Thoms, in conjunction with Mr. Herrmann, has studied the chemistry of rottlerin, a constituent of kamala, which is present in the so-called "kamalin" of Merck's manufacture, associated with iso-rottlerin of Perkin. The authors regard the latter as being simply impure rottlerin, containing resin. By a method of purification, consisting in repeated solution in chloroform and precipitation with ligroin, pure rottlerin, corresponding in its elementary composition to that given by Perkin ($C_{33}H_{30}O_9$), was obtained in form of light yellow crystals, m. p. 199° – 200° C. By the action of oxidizing agents it yields cinnamic acid, and by the action of KOH solution at 150° – 160° C., it is split up with formation of methyl-phloroglucin or 2, 4, 6 trioxymtoluene. These results show the close relationship of rottlerin with the well-known tapeworm remedies, filicic acid and kosin, which, like rottlerin, also yield phloroglucin derivatives.—Pharm. Ztg., li, No. 76 (1906), 837.

Salicin—Solubility in Water.—The solubility of salicin is given in the B. P. as being 1 in 28 parts of water at the ordinary temperature, which admits of a range of 10° F., while the U. S. P. gives the solubility as being 1 in 21 parts of water at the abnormally high temperature of 25° C. D. B. Dott finds the solubility of pure salicin, melting at 201.5° C., to be substantially as stated in the B. P., but that in water at 25° C. it is soluble only to the amount of nearly 1 in 24 parts.—Pharm. Journ., Jan. 26, 1907, 79.

Santonin—New Reactions.—C. Reichard describes a number of new reactions of santonin, as follows: When heated with concentrated alcoholic KOH a carmine-red color is developed. Ammonia produces a similar, but less intense, color reaction. A blue color is developed when santonin is heated with concentrated H_2SO_4 . A mixture of santonin and mercurous nitrate is blackened by H_2SO_4 , and the same results with a mixture of santonin and white precipitate. A mixture of cupric sulphate and cuprous chloride with santonin gives a beautiful blue color with H_2SO_4 ; a deep blue color is developed by the latter in a mixture of santonin and bismuth subnitrate, while with diphenylamine and santonin a red-brown color is developed on heating with H_2SO_4 .—Pharm. Ztg., lii (1907), No. 9, 88.

Strophanthin—Preparation in Crystalline Condition.—Iwanow obtains strophanthin in a well-crystallized form by the following process which is based on a method for its estimation recommended some time ago in the report of Cæsar & Loretz: 20 Gm. strophanthus seeds are extracted twice successively with 200 Gm. of absolute alcohol by heating on a water-bath 2 hours; the alcohol is distilled off, and the watery (? Rep.), greenish residue, heated to 40° or 50° C., is shaken out with petroleum-ether, carefully avoiding emulsification. The watery solution is now treated with neutral lead acetate as long as a precipitate is produced, the excess of lead is removed from the warmed liquid by H₂S, and the liquid filtered, the filter being washed with 600 to 700 Cc. of boiling water. The filtrate is then slowly evaporated in an Erlenmeyer flask on a water-bath at 60°–70° C. After two days, when the filtrate has been reduced to about 100 to 200 Cc., a copious deposit of strophanthin in form of crystalline needles and threads will form. These are collected on a filter, washed three or four times with a little cold water and dried, at first in the air, and finally in a vacuum exsiccator. So obtained, the crystals melt at 169° to 170° C.—Pharm. Ztg., li, No. 103–104 (1906), 1140; from Farmaz. Journ., 45 (1906), 639.

Vanillin—Occurrence in Dahlia Bulbs.—During the course of an investigation on dahlia bulbs Edmund O. von Lippmann obtained a quantity of alcoholic ether extracts which on evaporation yielded a syrupy residue smelling strongly of vanillin. From this substance boiling light petroleum extracted a semi-solid mass, which on standing for about ten years set to a mass of stellar crystals which were found to be nearly pure vanillin. A similar observation recorded by Payen (1823) appears to have hitherto escaped attention.—Pharm. Journ., Jan. 5, 1907, 9; from Berichte, 1906, 39, 4147.

COLORING MATTERS.

Chlorophyll—Products of Decomposition by Acid and Alkali.—Willstätter, contrary to previous statements, finds that chlorophyll does not contain phosphorus. It is decomposed on treatment with oxalic acid into an ashless derivative, insoluble in alcohol, called phæophytin, which is a wax, giving on hydrolysis a 30 per cent. yield of a nitrogen-free, primary alcohol, phytol, C₂₀H₄₀O, and two groups of nitrogenous products—phytochlorines and phytorhodines. Phytol cannot be crystallized, but distils in a low vacuum without decomposition. When chlorophyll is decomposed with alkalis, substances with acid properties are produced, named chlorophyllines, which are found to contain 3.5 per cent. of magnesium oxide, and when heated to 140°–200° C. with concentrated alkali give well-crystallized, fluorescent substances, containing 6 per cent. of magnesium oxide. The author has isolated these organo-magnesium compounds from various sorts of plants, such as algæ, pine needles, and grasses. Assimila-

tion of carbon dioxide is regarded as a reaction of the basic metal magnesium, and is compared to Grignard's reaction. It is concluded that two conditions of life exist—the life of synthesis, aided by magnesium, and the life of oxidation, aided by iron.—*Pharm. Journ.*, Nov. 17, 1906, 543; from *Chem. Ztg.*, 1906, 30, 955.

Crocetin—Crystalline Salts of the Alkalies.—Referring to the recent statement of Pfyl and Scheitz that the coloring matter of saffron, crocetin, forms crystalline salts of alkalies only with ammonia, F. Decker mentions that he has obtained both the potassium and sodium salts also in a crystalline state. The solution of crocetin in very dilute sodium or potassium hydroxide is mixed with alcoholic solutions of the respective alkali hydroxides until permanent precipitates are formed. The precipitates are redissolved by heating the mixtures on a water-bath, when, upon cooling, the salts will separate out in a crystalline condition, the sodium crocetin in the form of tufts of needles, the potassium crocetin in rhombic crystals. Both salts may be recrystallized from hot 50 per cent. alcohol.—*Pharm. Ztg.*, li, No. 63 (1906), 703; from *Chem. Ztg.*, 1906, No. 57.

Indigo—Practical Advantages of the Natural over the Synthetic Product.—Since synthetic indigo was put upon the market in 1897 some uncertainty has existed regarding its tinctorial value as compared with the natural dyestuff. The makers of synthetic indigo have maintained that the only significant constituent of natural indigo is indigotin, identical with the synthetic substance, and that the other components present in the natural dye are either inert or harmful impurities. On the other hand, certain practical dyers have held that the natural dye gives a certain richness of shade or "bloom," which is invariably absent from goods dyed with synthetic indigo. The results of a practical dye test of the two materials, made with the object of throwing light on this disputed question, are described by Mr. Cyril Bergtheil in a report to the Bihar Planters' Association. The conditions were such as to be strictly comparable for the two materials as regards concentration of the dye bath, temperature, and fabric dyed. The results obtained, working on the large scale under practical conditions and with dye baths of the same strength, were such as to uphold the objection of the dyers already referred to against the synthetic dye. Natural indigo not only gave a richer shade with the characteristic "bloom," but also actually a darker shade. The difference between the natural and synthetic material, which is hardly apparent in dyeing trials made on the small scale, appears to become of considerable importance under conditions such as exist in actual practice.—*Pharm. Journ.*, June 8, 1907, 749; from *Nature*, 1907, 75, 614.

ALBUMINOIDS.

(Including Animal Products.)

Proteins—Proposed Nomenclature.—The following recommendations, the outcome of a prolonged consideration of the subject of the nomenclature of the proteins by a number of chemists and physiologists, nominated by the physiological and the chemical societies respectively, have been approved at a meeting of the Publication Committee of the Chemical Society, at which the physiologists were present :

I. The word proteid—which is used in different senses in this country and in Germany—should be abolished.

II. The word protein is recommended as the general name of the whole group of substances under consideration. It is at present so used both in America and Germany. It admits readily of the use of such derived words as protease and proteose. If used at all, the term albuminoid should be regarded as a synonym of protein.

III. The sub-classes should be as follows :

1. *Protamines.*—These are simple members of the group. They are exemplified by substances like salmine and sturine, which have been separated from fish-sperm.

2. *Histones.*—These are more complex substances: this and the previous class probably pass gradually into one another. The class is exemplified by the histones separated by Kossel from blood corpuscles; precipitability by ammonia is one of their distinguishing features.

3. *Albumins.*—These are proteins, of which egg-albumin and serum-albumin may be taken as typical examples.

4. *Globulins.*—These are proteins which differ from the albumins in solubility; they are more readily "salted out" of solution than the albumins. They are exemplified by serum-globulin and fibrinogen. The class should also include certain derivatives of globulins such as fibrin and myosin.

5. *Sclero-proteins.*—This new word takes the place of the word albuminoid in the limited sense in which the majority of physiologists have been accustomed to use it. It includes such substances as gelatin and keratin; the prefix indicates the skeletal origin and often insoluble nature of its members.

6. *Phospho-proteins.*—This class includes such substances as vitellin and caseinogen with its derivative casein. The prefix "nucleo-" frequently used in relation to this class is incorrect and misleading.

7. *Conjugated proteins.*—These are substances in which the protein molecule is united to a "prosthetic group." The principal sub-divisions are :

(a) *Nucleo-proteins*.

(b) *Gluco-proteins* (e. g., mucin).

(c) *Chromo-proteins* (e. g., hæmoglobin).

8. *Derivatives of proteins*.—Of these the products of protein-hydrolysis (a term preferable to proteolysis) are those which require special attention. These should be classified as follows:

(a) *Meta-proteins*.—This term is suggested in place of albuminate (acid-albumin, alkali-albumin), which is objectionable because (1) these products are obtainable from both albumins and globulins, also (2) because the termination “-ate” implies a salt.

(b) *Proteoses*.—This term includes albumose, globulose, gelatose, etc. The subdivision of these into proto-, hetero-, deuteroproteoses, etc., and the various modifications of Kühn's original classification have been considered; the whole subject is, however, at present too unsettled for any final nomenclature of these sub-divisions to be proposed.

(c) *Peptones*.—This term should be restricted to the further products of hydrolysis which differ from the proteoses inasmuch as they cannot be salted out from solution and usually resemble them in giving the biuret test.

(d) *Polypeptides*.—The majority of the polypeptides are synthetical substances. Some, however, have been separated from the products of protein-hydrolysis, and it is, therefore, advisable to include them in the present classification. They are products of cleavage beyond the peptone stage, and consist of two or more amino-acids in association; the majority of those hitherto prepared do not give the biuret test.

IV. The term caseinogen should be used for the principal protein in milk and casein for its derivative, which is the result of the action of rennet.

V. The two principal proteins of the muscle plasma should be termed paramyosinogen and myosinogen; the term soluble myosin should take the place of v. Fürth's soluble myogen-fibrin; the term myosin should be restricted to the final product formed during *rigor mortis*.—Pharm. Journ., March 9, 1907, 288.

Milk Proteids—Simple Method of Quantitative Determination.—T. R. Boggs describes the following simple and accurate method for the determination of milk proteids by precipitation with phosphotungstic acid: Twenty-five Gm. of phosphotungstic acid is dissolved in 125 Cc. of distilled water, and when solution is complete an equal quantity of dilute hydrochloric acid is added to it. The solution is quite stable, and keeps for months in a dark bottle. The method of procedure is as follows: The diluted milk is poured into an ordinary Esbach albuminometer tube (reading from 1 to 7 Gm. per liter) up to the mark U, the phosphotungstic acid solution is then added up to the mark R, the tube is corked and slowly

inverted twelve times, shaking being avoided. The tube is then placed in a rack for twenty-four hours, and the percentage read off at the level of the top of the precipitate. The optimum dilution for human milk is 1 in 10, for cow's milk 1 in 20; if the proteid content is low a less dilution may be employed. Controlled by Kjeldahl nitrogen determinations, the mean error was 0.3 per cent., the extreme 0.7 per cent. Temperatures of from 15° to 25° C., and the presence or absence of cream make no difference in the volume of the precipitate, which attains a minimum after standing twenty-four hours, and does not alter on further standing.—Pharm. Journ., Nov. 17, 1906, 541; from Bull. Johns Hopkins Hosp., Oct., 1906, No. 187.

Proteids of Human Milk—Estimation with Alcoholic Citric Acid Solution.—A. W. Sikes finds that the proteids in human milk may be determined by precipitation with alcohol containing citric acid. Four to 5 Gm. of the milk is weighed out, two or three drops of a saturated solution of citric acid in alcohol added, and the mixture washed into two tubes of a centrifuge, about 100 Cc. of absolute alcohol being used for the purpose. The mixture is boiled on a water-bath and centrifuged, the clear fluid is decanted off, and the precipitate extracted twice with 30 Cc. of boiling alcohol each time, washed with a little alcohol into a weighed platinum capsule, dried at 103° C., cooled, and weighed.—Pharm. Journ., Nov. 17, 1906, 541; from Journ. of Physiol., 34, No. 6, 481.

Milk—Mercuric Chloride a Preservative for Samples.—P. Grelot finds mercuric chloride to be superior to other preservatives, such as potassium dichromate, formaldehyde, chloroform, and also sterilization by heat, for the preservation of samples of milk for examination. The addition of 0.05 Gm. of mercuric chloride and 0.0125 Gm. of ammonium chloride to each 250 Cc. of milk intended for analysis, will permit the sample to be kept for ten days, at least, without undergoing any change that will materially affect the analytical constants. It has also the advantage that it will not interfere with tests for those preservatives and other additions which are often fraudulently made. Being volatile, no increase of ash will be evident.—Pharm. Journ., May 18, 1907, 649; from Journ. de Pharm. et Chim., 25 (1907), 423.

Milk—Convenient Method of Distinguishing the Raw from the Pasteurized Product.—Bruère recommends for the convenient application of the guaiacol-hydrogen-dioxide test, proposed by Dupuy and others for the distinction of raw and pasteurized milk, to employ tablets composed as follows: No. 1 = 0.05 Gm. guaiacol and 0.25 Gm. milk-sugar; No. 2 = 0.25 Gm. sodium perborate. In use, tablet No. 1 is triturated with 5 Cc. of water and mixed with 10 Cc. of the milk under examination; then tablet No. 2, also triturated with water, is added to the mixture. In the case of raw milk, the mixture at once assumes a salmon-red color, while pasteur-

ized milk does not produce this coloration.—Pharm. Ztg., lii (1907) No. 13, 128; from Bull. des sc. pharm., 1907, No. 1.

Milk—Microscopic Method of Distinguishing the Raw from the Boiled Product.—C. Hartwich recommends a physical method for the distinction of raw from boiled milk, which depends on the greater rapidity with which the fat separates on the surface of the raw article. A small drop of the milk is placed on the object glass, the cover-glass is carefully placed on so that the milk may not be spread out unnecessarily, and it is then viewed under a lens of 60 diameters. Primarily it will be noticed that the number of large fat-drops is greater on the boiled than on the raw milk. This in itself is of no importance; but after less than a minute it will be noticed that the little fat-drops of the unboiled milk are no longer distributed uniformly, that they form cloudy conglomerations and after a few minutes form lumps, interspersed with isolated small fat-drops in small number, which eventually also unite so as to form large lumps. The boiled milk, on the other hand, exhibits a uniform division of the fat into small drops, which remain unchanged for a long time. This distinction is so marked that it becomes possible to recognize the addition of raw to boiled milk within certain limits. The addition of 25 per cent. of raw milk is distinctly recognizable, although the lumps produced are smaller, and the number of isolated small fat-drops is greater; while, by comparison with a field of pure boiled milk, it becomes possible even to detect an admixture of 12.5 per cent. of raw milk.—Schweiz. Wschr. f. Chem. u. Pharm., xlv, No. 38 (1906), 629.

Milk—Test of Freshness with Methylene Blue.—Dr. P. T. Müller utilizes the property of lactose and allied bodies to convert methylene blue into a colorless substance, as a test for the freshness of milk. He adds 0.2 Cc. of a very dilute methylene blue solution to 2 Cc. of milk in a test-tube, and pours a layer of liquid paraffin over the mixture. The tubes are incubated at 37° C., and reduction takes place after varying intervals. Fresh milk usually shows the change after eight or ten hours, whilst milk that has been kept for some time reduces the methylene blue after a period varying from a few minutes to half an hour.—Pharm. Journ., July 14, 1906, 31; from Arch. f. Hygiene, 56, 108.

Milk—Detection of Formaldehyde.—F. H. Alcock observes that when milk is heated with strong hydrochloric acid it is often difficult to ascertain whether the peculiar change of color (pale salmon-colored tint) seen at the commencement of the operation is due to a trace of formalin or not. In order to be sure on this point the following method is suggested: To 2 Cc. of the milk add an equal volume of a 20 per cent. solution of potassium hydroxide, and shake vigorously; then add an excess of strong hydrochloric acid, and warm gently. A coagulum is the result, which becomes more or less deeply tinted of a violet color, according to the

quantity of formalin present in the milk. The liquid below the coagulum (which floats) is quite colorless and nearly clear, or only slightly turbid, but gradually acquires the color of the coagulum, which persists for many days.—Pharm. Journ., July 14, 1906, 28.

Soured Milk—Remedial and Food Value.—Metchnikoff highly recommends soured milk as a food and therapeutic agent, and he describes in detail the lactobacillus which he was able to isolate, and which, if added to fresh milk, produces the peculiar semi-solid mass known as "*lait aigrit*" (junket). He recommends the use of soured milk as an article of diet for the prevention of the changes incident to advanced age, which he attributes to the constant autointoxication which goes on in the human body. The chief source of this autointoxication are the intestinal fermentative products, and by diminishing these the changes of old age may possibly be somewhat retarded. Metchnikoff regards soured milk as a product useful for this purpose. The microbes of putrefaction thrive only in alkaline media, and acids prevent their development. Metchnikoff recommends the preparation of soured milk from skimmed and boiled milk, which is free from injurious germs and comparatively free from fat, which, in the process of fermentation, becomes split up and gives the product a nauseous taste. He uses for this purpose a culture of a Bulgarian lactobacillus, to which is added a second culture of a very harmless milk-coagulating germ from the European flora. The milk is simply mixed with a convenient amount of these cultures, enough being added to prevent the development of other germs should they have remained after boiling. The whole is then set aside in a warm place for a few hours, and the soured milk is ready.—Nat. Drugg., Sept., 1906, 298; from Roussky Vrach, through N. Y. Med. Journ.

Blood—Reaction with Tincture of Guaiac.—C. E. Carlson has made a comprehensive study of the causes that determine the development of a blue color when tincture of guaiac is brought in contact with blood in the presence of "ozonized" oil of turpentine or of hydrogen dioxide. He finds this to be due to the presence of an organic compound in the blood which assimilates OH from the hydrogen dioxide or the oil of turpentine, forming an unstable compound which almost immediately gives off OH to the tincture of guaiac. While the author gives preference to 3 per cent. hydrogen dioxide, on account of greater certainty and the sharpness of the reaction, he finds that tincture of guaiac is not oxidized or colored blue either by atmospheric oxygen, or ozone, nor by nascent oxygen. Furthermore, oil of turpentine, even old, which has been exposed to air and light, does not contain either ozone nor hydrogen dioxide. The availability of oil of turpentine in the guaiacum-blood test depends upon the formation of molecularly combined hydroxyl groups, which are capable of developing the blue color in the tincture by direct addition.—Pharm. Ztg., li, No. 63 (1906), 702; from Ztschr. f. physiol. Chem., 48, 69.

Egg-Albumen—Variable Phosphorus Content.—While heretofore nothing has been published concerning a content of phosphorus in egg-white, K. Kass has now determined its presence with certainty. He found it in fresh albumen of a hen's egg to the amount of 0.155 per cent.; but it is apparently present in such in variable quantity, for he obtained from the albumen of an egg laid by the same hen after keeping it four weeks, 0.228 per cent. He concludes from this that by prolonged keeping in contact with the yolk, the phosphorus content is increased by diffusion from the latter. He has, furthermore, found in the course of his examination that the phosphorus may be entirely absent in one sample of egg-albumen, while in another he was able to demonstrate the presence of as much as 0.352 per cent.—Pharm. Ztg., li, No. 63 (1906), 700; from Monatsh. f. Chem., 1906, No. 5.

Egg Yolk—Commercial Analysis.—According to agreement at the Turin Conference the following determinations are to be made in a commercial analysis of egg yolk:

Water: 10–20 Gm., mixed with sand, are dried in a flat dish, first at a low temperature and finally at 100° C. to 105° C., to constant weight.

Fat: The dry residue is extracted with petroleum ether (b. p. 70° C. to 75° C.) in a Soxhlet apparatus, the greater part of the petroleum ether is distilled off, the residual solution transferred to a beaker and dried one hour at 100° C. to 105° C. If the yolk contains

Boric Acid, 2 Gm. of the fat are dissolved in petroleum ether, the solution shaken out two or three times with distilled water at 30° C., 20 Cc. of neutral glycerin and a few drops of phenolphthalein, T. S., added to the aqueous solution; this is titrated with normal alkali (1 Cc. normal alkali = 0.0613 Gm. H_3BO_3), and the quantity of boric acid so determined is deducted.

Sodium Chloride: The residue in the Soxhlet apparatus, after freeing it from petroleum ether, is transferred to a funnel and washed with hot water into a 250-Cc. flask until exhausted; the solution is adjusted to 250 Cc., and an aliquot part titrated with $\frac{N}{10}$ silver nitrate solution.

Ash: 10 Gm. of the yolk are dried in a platinum dish and carefully reduced to ash. If then the total ash exceeds the sodium chloride content by more than 1.5 per cent., the ash must be examined for borax or other inorganic salts. So far no reliable data have been ascertained whereby the yolks of hens' or ducks' eggs can be differentiated.—Pharm. Ztg., li, No. 90 (1906), 998; from Chem. Ztg., 1906, Rep. 35.

Ferments—Mutual Incompatibility.—The experiments of Dr. Thorald Sollmann show that liquid preparations containing more than one digestive ferment are worthless. He finds that trypsin is destroyed in six hours at 40° C. by pepsin in a solution containing 0.112 per cent. of hydrochloric acid. Pepsin is completely destroyed by trypsin in alkaline solution.

The activity of diastase is weakened by pepsin even in neutral solution, but is unaffected by trypsin. Rennin is not destroyed by pepsin, nor is invertin injured by pepsin, trypsin or diastase. Preparations supposed to contain all the active agents of digestion were found to be entirely devoid of proteolytic or amylolytic properties.—Pharm. Journ., Feb. 9, 1907, 293; from Lancet, March 2, 1907.

Digestive Ferments—Inquiry into the Conditions Determining the Preference Shown by Medical Men for Certain Forms over Others Having Official Recognition.—One of the most interesting papers read at the 1906 meeting of the Pennsylvania Pharmaceutical Association is that of Franklin M. Apple, in which he presents a study of the digestive ferments of to-day, with special reference to the classes of the same, the extent to which they are prescribed, and the amounts, as ascertained from reliable sources, in which they are respectively sold at wholesale. After a careful review of the several processes of digestion, the conditions necessary for the same to proceed, the composition and proportions of the average diet ingested, the relative duration of each digestion, and the literature offered as to the claims for the numerous proprietary preparations which have been successfully exploited by their manufacturers, the author concludes that it is almost beyond doubt that the animal digestive agents are being replaced to a large degree by those manufactured from the members of the vegetable kingdom having digestive powers, and that the various digestive mixtures advertised to the medical profession are very largely superseding our official digestants, notwithstanding the extravagant and fulsome claims made by their promoters. As a remedy for these unsatisfactory conditions, the author suggests that a higher test pepsin should be made official, it being quite as easy to prepare a 1:6000 as a 1:3000 pepsin, with the further advantage of being less hygroscopic, more readily soluble, and nearly free from odor; that the quality of pancreatin be improved, and provision made for its exhibition in a form in which it will reach the intestines unaltered by the acid fluids of the stomach; that the diastase of malt, which has in many ways been shown to be superior to pancreatin and ptyalin, should receive greater attention; and that investigations concerning the source, nature and preparation of vegetable digestive agents, should be diligently pursued.—Proc. Penna. Pharm. Assoc., 1906, 135-143.

Pancreatic Ferment—Influence of Calcium Salts on its Action.—Continuing his previously recorded investigation on the remarkable action of soluble salts of calcium in endowing the pancreatic ferment with an active trypsin-like power, C. Delezenne now finds that when once this activity has been acquired, the presence of the lime salt is no longer essential, and that after the entire removal of calcium salts the ferment retains its power of digesting albumin and gelatin. It is also found that the digestive action is not gradually acquired by contact of lime salts with the pancreatic ferment, but makes its appearance with great suddenness; thus, natural pan-

creatic juice maintained at 40° C. with a dilute solution of calcium chloride will not render gelatin non-congealing in four hours and thirty-five minutes, but will have acquired its maximum activity in this respect in another three minutes. After that, the digestive power slowly falls. If the lime salts be removed a few minutes before the time required to render the ferment an active trypsin, the period of the appearance of the acquired activity is much retarded. Many of the properties of lime-treated pancreatic ferment resemble those of fibrin ferment; and both are influenced by the physical nature of the walls of the containing vessel with which their solutions are in contact.—Pharm. Journ., April 6, 1907, 433; from Compt. rend., 144 (1907), 388.

Pepsin—Effect of Brief Contact with Certain Inorganic Compounds.—

J. F. Tocher records the results of experiments which show that pepsin cannot be mixed indiscriminately with certain inorganic compounds without suffering loss or complete destruction of activity. His conclusions are as follows:

1. Solutions of sodium bicarbonate, sodium, potassium and ammonium hydrates when added to solutions of pepsin in the cold have an immediate inhibitory or destructive effect on pepsin, according to the concentration. In ordinary concentrations the effect is to destroy the enzyme immediately.

2. Dilute solutions of caustic alkali immediately destroy the activity of dilute solutions of pepsin. 1 Cc. of decinormal ammonia (0.0017 Gm. NH_3) is quite sufficient to destroy the proteolytic power of 0.005 Gm. of pepsin in 10 Cc. of water. That is, a 0.1 per cent. solution of pepsin with an alkalinity equal to 0.017 per cent. has no proteolytic power whatever. On acidifying and digesting, the enzyme is found to be destroyed. Pepsin should therefore never be prescribed with alkalies.

3. Carbonate of bismuth precipitates pepsin from aqueous solutions; subnitrate of bismuth does not.

4. Compound mixtures containing solution of bismuth, morphine, carmine, etc., should contain no pepsin, since the activity of the enzyme is much retarded by the morphine, and is destroyed proportionally to the amount of alkali present in solution.—Trans. Brit. Pharm. Conf. (Year-book of Pharm.), 1906, 307-312.

Pepsin—Precaution in the Official Assay.—Charles E. Vanderkleed observes that in making the U. S. P. assay of pepsin, it is difficult to thoroughly disintegrate the coagulated albumen by means of a glass rod tipped with cork or rubber, as directed by the Pharmacopœia, and that a few vigorous shakes will accomplish this result more effectually. The subsequent agitation, every ten minutes during the digestion, by inverting the bottle once, should, however, be rigidly adhered to as officially directed, so as to insure the stringency of the test.—Proc. Penna. Pharm. Assoc., 1906, 133.

Pepsin—Assay by the Biuret Reaction.—In a previous paper (see Pro-

ceedings, 1906, 950), W. B. Cowie and William Dickson pointed out the applicability of the biuret reaction in determining the relative peptonizing powers of pepsins in terms of a

Standard Solution of Potassium Permanganate. It remained, however, to standardize this permanganate solution against a known amount of real peptone, and in their present paper they communicate the details of experiments by which this was accomplished. They find that each cubic centimeter of a standard solution containing 0.04 Gm. of potassium permanganate in a liter is the equivalent of 0.25 Gm. of peptone, the percentage of peptone from a given amount of albumen being determined by means of this factor as explained in the following process.

An amount of scale albumen equal to 1 Gm. of actual or dried albumen is placed in a glass mortar, triturated, and washed into a 100-Cc. flask with 20 Cc. of water at 40° C. The albumen is coagulated by heating on the water-bath for fifteen minutes. It is now cooled to 40° C. and 0.25 Gm. pepsin added, which is washed into the flask with 50 Cc. of $\frac{N}{10}$ hydrochloric acid. The whole is vigorously shaken, placed in water, kept in a digesting pan at 40° C. for four hours, the flask being shaken every half-hour. At the end of that time the flask is immersed in boiling water for a quarter of an hour to prevent further action of the enzyme; the contents are then cooled to 15° C. and made up to 100 Cc. with water; 10 Cc. of the mixed liquid are placed in a test-tube, 13 Gm. of zinc sulphate and 0.2 Cc. H_2SO_4 (1 : 4) being added. The whole is then heated to boiling, cooled quickly with centrifugal action, and filtered through a dry filter (double-Swedish) into a dry test-tube. Five Cc. of the filtrate are placed in a 100 Cc. Nessler tube, mixed with 15 Cc. of water, 1 Cc. of 0.5 per cent. solution of copper sulphate, and made up to 80 Cc. with 30 per cent. sodium hydroxide solution. (Any slight precipitate may be filtered off through glass wool, or the precipitate may be allowed to settle and an aliquot part of the clear liquid pipetted off and Nesslerized.) Seventy-five Cc. of distilled water are placed in a similar tube, and the standard permanganate solution (0.04 Gm. per liter) is run in from a burette until the depth of color is the same in each, the tubes being viewed longitudinally over a mirror, as in Nesslerizing. A blank experiment is carried out in exactly the same manner, except that the albumen is not added. The results are calculated as follows:

Cc. of standard solution required, minus blank in Cc. multiplied by 0.25 multiplied by 100 = percentage of peptone from albumen used.

The following advantages are claimed for this method:

(1) It is a measure of the actual peptonizing power, as distinct from the solvent action, of a pepsin.

(2) It yields results sufficiently near those obtained by standard methods to give a very good idea of the power of a pepsin.

(3) It can be carried out in a comparatively short time (six samples can be put on and completed in eight hours).

(4) No special apparatus is required.—Pharm. Journ., Feb. 23, 1907, 198.

Diastase—Examination of Samples of Different Origin.—W. H. Blome gives in detail an account of the examination of four commercial samples of diastase, undertaken to determine their actual and relative value. One of these samples was of animal (pancreatic) origin, a second of fungus origin, the other two were samples of malt diastase—these various brands being numbered 1, 2, 3 and 4 in the order named, and designated throughout the paper as pancreatic, plant and malt diastases, respectively. The amylolytic action of the diastases was determined by the action, under prescribed and identical conditions, of 0.1 per cent. solutions of the diastase in water containing 25 per cent. of glycerin upon 2 per cent. potato starch solution, these solutions being prepared fresh each morning. Referring to the original paper for the details of the author's experiments, it may suffice here to state that his results lead him to the conclusions that No. 1 is about four times as strong as No. 2, eight times as strong as No. 3 and eleven times as strong as No. 4. Also, that No. 1 converts starch into substances causing greater copper reduction than No. 2 and No. 4, due to the greater amount of maltose and dextrose with a lesser amount of the intermediate substances than No. 2 and No. 4. Moreover, No. 2, 3 and 4 contained appreciable quantities of copper-reducing substances; No. 1 none.—Pharm. Rev., Sept., 1906, 260-266.

Adrenalin or Epinephrin?—A Question of Pharmacopœial Nomenclature.—In view of the disposition in some quarters to assign the name of "adrenalin" a subordinate position to the name "epinephrin" for the pharmacopœial designation of the active principle of the suprarenal gland, Thomas Maben reviews the history of these substances and submits facts which, he thinks, must substantiate the following claim: "Adrenalin is the active principle of the suprarenal gland, and if this principle is made an official drug by being included in the next British Pharmacopœia, it is clear that, following the example set by the new Belgian Pharmacopœia, adrenalin is the name by which it should be known. Presumably there are only two possible names—adrenalin or epinephrin. Adrenalin is proved to have always been, and epinephrin has been proved to have never been, the active principle. Moreover, as a commercial substance epinephrin is unknown, whereas adrenalin has been known for the last six years, and is in daily use over the entire civilized world." It may be urged as an objection to adrenalin that it is a proprietary preparation, but in reference to this he points out that "adrenalin" is not a registered trade-mark nor a fancy name. "It is a truly descriptive word, meaning the active principle of the adrenal substance, as the suprarenal gland is commonly termed."—Pharm. Journ., March 30, 1907, 388-390.

Adrenalin—A New Characteristic Reaction.—In the course of experi-

ments undertaken to ascertain if the known tests for adrenalin are quite reliable, Alex. Gunn and E. F. Harrison found that the fixed alkalies produce a reaction with adrenalin, which, so far as they are aware, has not heretofore been recorded. On treating the dry substance with solution of caustic potash or soda in the cold a red-brown coloration gradually and quickly develops, and at the same time an odor resembling in a remarkable way that of phosphoretted hydrogen is produced. This odor does not disappear even in the course of a few days, in the case at least of comparatively strong solutions, and it is even observable in the liquid while it is being gradually heated up to boiling. While boiling the odor is quite noticeable, but not so distinctive as when cold. On cooling the boiled liquid the odor becomes as strong as at first. So exactly similar is it to that of phosphoretted hydrogen that it occurred to the authors that the material might contain phosphorus, but careful experiments made prove its absence, not a trace being found. All commercial samples of reputable manufacture, including a sample of "synthetic adrenalin" obtained from Meister, Lucius & Brünning, gave identically the same reaction. The best method of applying the test is to place a small quantity of the dry adrenalin or a few drops of the 1 : 1000 solution of the same in a small 1-inch porcelain crucible and add 5 or 6 drops of 10 per cent. solution of caustic soda. The solution will gradually become colored, and at the same time the characteristic odor will develop in a few seconds, more or less, according to the amount of adrenalin present. It is advisable, however, to allow from half a minute to a minute or more to elapse, when the odor will have fully developed.—Pharm. Journ., June 1, 1907, 718.

Synthetic Suprarenin (Adrenalin)—Preparation.—As a result of the numerous investigations carried out since the discovery of the active constituent of the suprarenal gland by Takamine in 1891 and by Aldrich almost simultaneously, and the formula of this active constituent, adrenalin or suprarenin, having been definitely determined to be $(\text{HO})_2\text{C}_6\text{H}_3\text{CHOH}\cdot\text{CH}_2\text{NHCH}_3$, it has now become possible to prepare this base synthetically by a patented process (D. R.-P. No. 152814, No. 157300) as follows: By the reaction of chloracetopyrocatechin = $(\text{HO})_2\text{C}_6\text{H}_3\text{COCH}_2\text{Cl}$ (obtained by the action of chloracetic acid on pyrocatechin) with methylamine, methylaminoacetopyrocatechin = $(\text{HO})_2\text{C}_6\text{H}_3\text{COCH}_2\text{NHCH}_3$ is obtained. This substance very closely resembles suprarenin, and possesses to some extent—although much weaker—the property of augmenting blood pressure. By appropriate treatment with reducing agents, this ketone is then converted into the corresponding secondary alcohol, *o*-dioxypheylaethanolmethylamine = $(\text{HO})_2\text{C}_6\text{H}_3\text{CHOH}\cdot\text{CH}_2\text{NHCH}_3$, which is identical in composition and all its chemical properties with the natural suprarenin obtained from the suprarenal gland. Synthetic suprarenin is now supplied in the form of its hydrochloride (suprareninum hydrochlorium) in sterilized solution 1 : 1000, in vials of 5 and 10 Cc.,

and this is used and possesses identical activity in the same doses as the hydrochloride of the natural base.—*Pharm. Ztg.*, lii (1907), No. 45, 466-467.

Ophiotoxin—*The Toxic Constituent of Cobra Venom*.—Edwin S. Faust has isolated from the dried Indian cobra venom a body allied to sapotoxin, which he has named "ophiotoxin." It forms a pale yellow, amorphous powder, and is only slowly soluble in water after drying. The aqueous solutions are extremely toxic to animals when injected; the addition of caustic soda, however, renders it nearly inactive. Ophiotoxin reacts to litmus as a very weak acid; it is precipitated by saturated ammonium sulphate solution, but not by sodium chloride or sodium sulphate. It precipitates metals from alkaline, but not from acid solutions. It affords no reducing sugar when boiled with dilute acids. It contains the same number of carbon atoms as bufotalin, the toxic principle of toad poison, but twice as many oxygen atoms. The elementary analysis leads to the empirical formula $C_{17}H_{28}O_{10}$. The addition of solution of sodium hydroxide to the aqueous solution of ophiotoxin soon renders it inactive. *Apoth. Ztg.*, xxii (1907), No. 12, 119.

Vaccine Lymph—Preservation and Resistance to Low Temperatures.—F. R. Blaxall and H. S. Fremlin have presented to the Local Government Board a preliminary report, in which they record the results of sustained subjection of glycerinated calf lymph to temperatures below freezing point. It is found: 1. That in glycerinated lymph the active agent of vaccine not only can withstand freezing, but can survive a temperature of 180° C. below freezing point for a considerable time, and this without loss of potency. 2. That a glycerinated lymph can be retained in a cold store at -5° C. for a year without diminution of its potency, whereas glycerinated lymph, stored at 10° C. for a year parts with its activity to an uncertain but considerable extent. 3. That sustained subjection to cold appears to be in no sense hostile to the active agent of vaccine; that, on the contrary, lymph thus dealt with was capable of producing excellent vesicles on calves, and that the results obtained with it in human vaccination were wholly satisfactory.—*Pharm. Journ.*, Sept. 15, 1906, 305; from *Lancet*, Sept. 8, 1906, 669.

Urine—Clarification for Sugar Determination with the Polariscope.—A. Wiesler recommends freshly prepared aluminum hydrate obtained by precipitating the sulphate with ammonia, for clarifying the urine for sugar determination with the polariscope, finding it superior for this purpose to the blood charcoal or basic lead acetate usually employed. For this purpose 100 Cc. of the urine under examination are placed in a flask provided with two marks (100 and 110 Cc.) and weighed. The ascertained weight gives the specific gravity, the determination of which is regarded as very important in the case of urine containing glucose. From 5 to 10 Cc. of aluminum hydrate magma are then added, with enough urine, if neces-

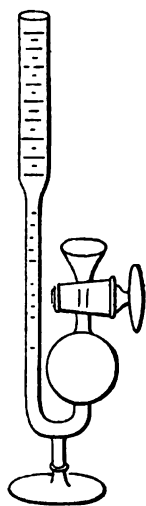
sary, to the mark, 110 Cc.; it is well shaken, and then filtered. The light-yellow filtrate may then at once be polarized in a 200-Mm. tube, in the usual manner.—Pharm. Ztg., li, No. 81 (1906), 899; from Ztschr. f. angew. Chem., 1906, No. 36.

Urine—Simple Method of Applying the Phenylhydrazine Test for Sugar.

—R. Grünwald recommends the following method for determining the sugar in urine: 10 Cc. of the urine are mixed with a solution of 1.20 Gm. of sodium acetate in 6 Cc. of water and 2 drops of acetic acid; 0.60 Gm. of phenylhydrazine hydrochloride is then added, the liquid reduced by gradual evaporation on the steam-bath to about 5 or 6 Cc., and then immediately cooled. In this way an abundant yield of well-developed crystals of phenylglucosazone are obtained in the presence of sugar, which are readily distinguishable from the brown-yellow precipitates of glucuronic acid. To complete the accuracy of the observation, the melting-point of the crystals may be determined; those of glucuronic acid melting at 155° C., whilst the crystals of the phenylglucosazone do not melt below 206° – 207° C. If sugar is present in very small quantities, a microscopic examination under a lens of 250–300 diameters, immediately after their separation, distinctly reveals the yellow crystalline needles of the phenylglucosazone.—Pharm. Ztg., lii (1907), No. 37, 384; from Münch. Med. Wschr., 1907, No. 15.

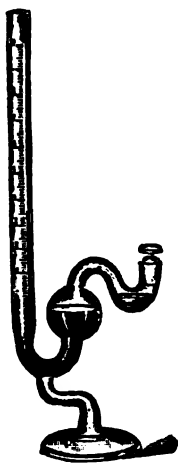
Urine—Sugar Determination by Fermentation.—Küchler & Sons supply

FIG. 46.



Saccharometer.

FIG. 47.



Saccharometer.

a new fermentation saccharometer (Fig. 46) which is said to indicate the percentage of sugar in urine with great accuracy. Dilutions of 1 in 20

record from 1.5 to 10 per cent. of sugar, while for smaller percentages undiluted solutions are used. In use, mercury is poured into the apparatus until it approximately reaches the 0 on the scale; 0.5 Cc. of urine is introduced, and 5 drops of a fresh solution of yeast is added (1 G. yeast to 5 Cc. water). By tipping the apparatus the mercury is now adjusted so that its level exactly corresponds to zero, and the cock is carefully turned. It should be kept at a temperature of about 20° C. The displacement is read on the scale in terms of percentage of sugar.—*Amer. Drugg.*, April 8, 1907, 198.

Urine—Modification of Lohnstein's Fermentation Saccharometer.—Th. and R. Lohnstein have improved their well-known saccharometer by an extension from the bulb of the short limb of the apparatus of a short bent tube, as shown by Fig. 47, thus forming a second, small U-tube, which is intended for the reception of 0.5 Cc. of the urine in which the sugar is to be determined by fermentation. The outer limb of this small U-tube permits of being hermetically closed by an accurately ground glass stopper, and the tube is expanded somewhat at the lower bend, so as to increase its capacity. The larger U-tube contains the measuring-fluid (glycerin, the longer arm being graduated so as to indicate the percentage of sugar in the sample of urine under examination.—*Pharm. Ztg.*, lii, No. 15 (1907), 148.

Urine.—Aloin as a Test for Blood.—N. A. Klimon finds that if acid urine is mixed with an equal volume of oxidized oil of turpentine, and a little aloin is added to the mixture, which is then well shaken and warmed for a short time, a purple color appears in the presence of blood; in its absence the liquid remains yellow. If old turpentine is not available it may be oxidized by the addition of hydrogen peroxide. Alkaline urine gives a similar reaction, but the purple color disappears on acidifying, whereas that due to blood is persistent. The presence of albumen does not interfere with the reaction except that bile pigments give a color similar to blood.—*Apoth. Ztg.*, xxi (1906), No. 93, 997; from *Russki Wratsch*, 1906, 5, 480.

Urine—Detection of Biliary Pigments.—L. Gimbert recommends the following test for the detection of biliary pigments in urine: Precipitate 10 Cc. of urine with 5 Cc. of barium chloride solution, collect the precipitate formed, and suspend in 4 Cc. of alcohol, 90 per cent., containing 5 per cent. of hydrochloric acid. The mixture is then heated in a boiling water-bath for a minute or two. If the liquid is colored bluish-green or green, bile is present. It may show a brownish tint, when on adding two drops of hydrogen peroxide the characteristic green shade will appear, in the presence of bile pigments. If the brown color persists without showing any green the bilirubin originally present has probably been decomposed by keeping. Urine which contains no bile pigments gives no coloration by this test.—*Pharm. Journ.*, July 14, 1906, 31.

Urine—Citric Acid as a Test for Mucus.—I.. Grimbart and E. Dulaud find that if mucous matter alone is present in urine it gives, when floated on a syrupy solution of citric acid, a nebulous zone, which is not completely developed for one or two minutes. With nitric acid such urine gives no ring or cloud at the immediate zone of contact but a slight turbidity considerably above the acid surface. When albumin alone is present no precipitate zone is formed with citric acid. That obtained with nitric acid is sharply defined and most evident at the point of junction of the two liquids. When both albumin and mucous matter are present a reaction will be obtained with both syrupy citric acid and with nitric acid. If much mucus occurs a second nebulous ring is formed above the sharply marked precipitate of albumin at the zone of contact.—Pharm. Journ., Jan. 19, 1907, 59; from Journ. de Pharm. et Chim., 1906, 24, 193.

Urine—Simple Test for the Presence of Acetone.—F. Lange finds that the presence of acetone in urine is conveniently determined by the following simple test, which is distinctly available even in presence of 0.0025 per cent.: The urine is mixed in a test-tube with some glacial acetic acid, a few drops of freshly prepared solution of sodium nitroprusside are added, followed by the careful addition of several cubic centimeters of ammonia so as to form a distinct layer on the specifically heavier mixture of urine and acid. In the presence of acetone an intensely violet colored ring will develop at the point of contact of the two layers, which in time darkens and finally becomes black. Neither alcohol nor aldehyde produce this reaction.—Pharm. Ztg., li, No. 81 (1906), 899; from Münch. Med. Wschr., 1906, No. 36.

Urine—Determination of Acidity by Means of Volumetric Solution of Lime.—The complicated and more or less inaccurate methods commonly employed for determining the acidity of urine lead C. Kolls to recommend a method, by means of volumetric solution of lime, which not only permits the direct titration of the urine, but has the advantage of the distinct and positive recognition of the end reaction. The volumetric lime solution is prepared by dissolving 10 Gm. of pure CaO in 1 liter of water, and after filtration standardizing it to the equivalent of phosphoric acid (P_2O_6). Such a solution will maintain its titre unchanged for several weeks if the cork stopper is provided with a soda-lime tube. This standardized solution is carefully added to 25 Cc. of the clear filtered urine until the free acids and the monophosphate are neutralized, which is indicated when a drop of the reagent produces a permanent turbidity, due to triphosphate. The acid number of the urine is then calculated according to the following formula:

$$S = \frac{\text{Cc. Ca} \times 3.55}{V}$$

in which "S" signifies the acid number per liter of urine expressed in

terms of P_2O_5 ; "Cc. Ca," the number of cubic centimeters of volumetric solution of lime consumed; and "V" the number of cubic centimeters of urine used for the titration.—Pharm. Ztg., li, No. 81 (1906), 899; from Pharm. Post, 1906, No. 35.

Uric Acid—New Methods of Determination.—A. F. Dimmock and F. W. Branson recommend three new methods for determining uric acid in urine; (1) *A measuring process*, in which a precipitate of ammonium urate is measured in a tube specially shaped and graduated in parts per cent. of uric acid. (2) *A volumetric process* in which a precipitate of ammonium urate is collected and washed with a saturated solution of ammonium nitrate until free from chlorides and decomposed after solution in distilled water by adding in excess a known amount of a volumetric solution of silver nitrate. After filtering off and washing the precipitate of urate of silver, the amount of nitrate of silver in the filtrate is determined by means of a standard solution of thiocyanate of potassium, the filtrate being first rendered acid with a few drops of dilute nitric acid (1 in 3), a few drops of saturated solution of iron alum being used as an indicator. (3) *A gasometric process*, in which the washed ammonium urate is decomposed by hypobromite of sodium in a specially devised apparatus which can also be used for the determination of urea, etc. Full details of the processes are given in the original paper, in "Lancet" (1907, 14), which must be referred to.—Pharm. Journ., Jan. 12, 1907, 27.

APPENDIX.

ALPHABETICAL LIST OF NAMES OF MEMBERS FROM WHOM MONEY HAS BEEN RECEIVED BY THE TREASURER FOR ANNUAL DUES OR CERTIFICATES, FROM JULY 1, 1906, TO JULY 1, 1907.

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Abbett, William A.....'06	\$5 00		Amount brought forward.....	\$365 00	\$27 50
Ackerman, Philip J.....'06	5 00		Bear, Pierre B.....'06	5 00	
Adams, Gustave H.....'07	5 00		Beasley, Robert S.....'06	5 00	
Adams, Arthur E.....'06	5 00		Beckberger, Henry.....'07	5 00	
Adams, Henry.....'06	5 00		Beck, Julius E.....'05-'06	10 00	
Adams, James H.....'06	5 00		Becker, Charles L.....'06	5 00	
Adams, James O.....'06	5 00		Becker, Irwin A.....'07	5 00	
Ade, Daniel A.....'06-'07	10 00		Becker, Ulrich W.....'07	5 00	
Ahlborn, Frank H.....'06	5 00		Behrens, Emil C. L.....'07	5 00	
Alexander, Charles E.....'06	5 00		Beitenmann, William W.....'06	5 00	
Allison, William O.....'07	5 00		Bell, Emil R.....'06-'07	10 00	
Alpers, William C.....'06	5 00		Bell, Robert N.....'06	5 00	
Anderson, Carl G.....'07	5 00		Bell, S. Howard.....'07	5 00	
Anderson, Wm. C.....'07	5 00		Bell, William Ray.....'06	5 00	
Andreen, Carl.....'06	5 00		Benfield, Charles W.....'07	5 00	
Andriessen, Hugo.....'06-'07	10 00		Benson, Andrew J.....'06	5 00	
Anewalt, Ellsworth Q.'04-'05-'06	15 00		Bent, Edward C.....'06	5 00	
Anglum, John.....'06	5 00		Benton, Wilbur M.....'06-'07	10 00	
Apmeyer, Charles A.....'06-'07	10 00		Hentz, Henry G.....'06-'07	10 00	
Apple, Franklin M.....'07	5 00		Berger, Ernest.....'06	5 00	
Appleton, Wm. R.....'05-'06-'07	15 00		Beringer, George M.....'06-'07	10 00	
Arneson, Thomas.....'06	5 00	\$5 00	Berner, Carl A.....'05-'06	10 00	
Arnold, Ethelyn B.....'05	5 00		Bernstein, Michael.....'06-'07	10 00	
Asher, Philip.....'06	5 00		Hernstroem, Gustaf.....'06	5 00	
Askew, Alfred J.....'06	5 00	5 00	Berryhill, Henry P.....'06	5 00	
Aughinbaugh, David C.....'06	5 00		Best, Samuel M.....'06	5 00	
Avis, James L.....'06	5 00		Petryer, Jacob.....'04-'05	10 00	
Axness, Ole M.....'05-'06	10 00		Heyschlag, Charles.....'07	5 00	
Baas, George A.....'06-'07	10 00		Bigelow, Charles F.....'07	5 00	
Bachelle, Percy von.....'05	5 00		Bigelow, Clarence O.....'06	5 00	
Bachelle, Rudolph von.....'06	5 00		Biggs, Warren H.....'06	5 00	
Bachman, Gustav.....'07	5 00		Bingham, Charles C.....'06	5 00	
Bacon, Ephraim.....'06	5 00		Blackmore, Henry S.....'06-'07	10 00	
Baer, Jacob M.....'06-'07	10 00		Blackwood, Russell T.....'07	5 00	
Baguley, Clarence B.....'05	5 00		Blahnik, Marie (Mrs.).....'06-'07	10 00	
Baigent, John T.....'06	5 00		Blakely, George C.....'05-'06-'07	15 00	5 00
Bailey, William E.....'06	5 00		Blakely, Collins.....'05	5 00	
Baily, Frank G.....'06-'07	10 00		Blakeslee, Louis G.....'06	5 00	
Baird, Julian W.....'07	5 00		Blanding, William O.....'07	5 00	
Baker, Edwin.....'07	5 00		Blank, Herman G.....'06	5 00	
Baker, Walter N.....'06-'07	10 00	7 50	Bletcher, Henry E. J.....'07	5 00	
Ball, Charles E.....'07	5 00		Blome, Walter H.....'07	5 00	
Ballagh, Wilfred T.....'07	5 00		Boberg, Otto J. S.....'07	5 00	
Balser, Gustavus.....'07	5 00		Bodemann, Wilhelm.....'06	5 00	
Baltzly, Zachariah T.....'07	5 00		Hoeddiker, Otto.....'06-'07	10 00	
Bandy, George.....'06	5 00	5 00	Boehm, John J.....'06	5 00	
Bard, William E.....'07	5 00		Boehm, Solomon.....'06	5 00	
Barnes, Henry C.....'05-'06	10 00	5 00	Hoerner, Emil L.....'06	5 00	
Barnes, Walter E.....'06	5 00		Bohmansson, Robert H.....'07	5 00	
Bartells, George C.....'06	5 00		Boldt, Fred. W.....'05	5 00	
Bartlett, James E.....'06-'07	10 00		Bond, J. Newlon.....'06	5 00	
Bartley, Elias H.....'07	5 00		Bond, John B.....'06-'07	10 00	
Barton, Willard M.....'06	5 00		Bond, John E.....'07	5 00	
Base, Daniel.....'07	5 00		Bongartz, Ferdinand A.....'07	5 00	
Bastian, Otto C.....'06-'07	10 00		Bonta, Clarence L.....'06	5 00	
Bate, Henry J.....'06	5 00		Borell, Henry A.....'06	5 00	
Baur, Jacob.....'06-'07	10 00		Bowman, Waldo M.....'07	5 00	
Beal, James H.....'07	5 00		Boyd, Charles N.....'06	5 00	
Amount carried forward.....	\$365 00	\$27 50	Amount carried forward.....	\$720 00	\$32 50

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward.....	\$720 00	\$32 50	Amount brought forward.....	\$1170 00	\$40 00
Boyd, George W. ....'06	5 00		Cohn, Alfred I. ....'06	5 00	
Brack, Charles E. ....'07	5 00		Colby, Charles L. ....'07	5 00	
Bradbury, Wymond H. ....'06	5 00		Cole, Victor L. ....'06	5 00	
Bradley, Theodore J. ....'07	5 00		Coleman, John. ....'07	5 00	
Bradt, Warren T. ....'06	5 00		Coleman, John H. ....'06-'07	10 00	
Brand, Joseph H. ....'05-'06	10 00		Collier, William K. ....'05-'06	10 00	
Brandis, Ernest L. ....'06	5 00		Collins, Albert B. ....'06	5 00	
Brashear, Owen L. ....'06	5 00	7 50	Collins, Frank A. ....'06	5 00	
Brenner, George F. ....'06	5 00		Collins, John L. ....'06	5 00	
Breslin, Michael T. ....'06	5 00		Collins, John S. ....'06	5 00	
Bretsch, John L. ....'06	5 00		Collins, Mary E. ....'06-'07	10 00	
Brickman, Arthur O. ....'06	5 00		Compton, Paul. ....'06	5 00	
Briggs, Andrew G. ....'06	5 00		Congdon, George G. ....'07	5 00	
Brinker, John H. ....'06	5 00		Conger, Stephen B. ....'07	5 00	
Brookes, Virginia C. ....'06	5 00		Conzet, Rufus W. ....'07	5 00	
Brooks, George W. ....'06	5 00		Coody, Archibald S. ....'06	5 00	
Brown, Edward P. ....'06	5 00		Cook, Alfred D. ....'06-'07	10 00	
Brown, George S. ....'04	5 00		Cook, Elliot D. ....'06-'07	10 00	
Brown, John C. ....'06	5 00		Cook, E. Fullerton. ....'06-'07	10 00	
Brown, J. Lee. ....'06	5 00		Cook, Thomas P. ....'06	5 00	
Brucker, Carl. ....'07	5 00		Coonley, Charles. ....'06	5 00	
Brundage, Albert H. ....'06	5 00		Coons, William J. ....'06	5 00	
Brunn, Harold N. ....'06	5 00		Cormick, John W. ....'06	5 00	
Buckner, John C. ....'06	5 00		Cornell, Edward A. ....'06	5 00	
Bunnell, Lynn L. ....'06	5 00		Corning, Albion J. ....'07	5 00	
Buntin, William C. ....'06	5 00		Coté, André A. ....'05-'06	10 00	5 00
Burg, John D. ....'06-'07	10 00		Coulson, James T. ....'06	5 00	
Burgheim, Jacob. ....'06	5 00		Covington, Samuel M. ....'06	5 00	
Burke, William H. ....'07	5 00		Cowan, John. ....'04-'05	10 00	
Burke, William T. ....'06	5 00		Cramer, Max. ....'06-'07	10 00	
Burnham, Alfred A., Jr. ....'07	5 00		Crawford, Claude M. ....'06	5 00	
Burnham, Ralph F. ....'07	5 00		Crawford, Frank E. ....'06	5 00	
Burrough, Horace. ....'05-'06	10 00		Crawford, Joseph. ....'06	5 00	
Burrough, Horace, Jr. ....'05-'06	10 00		Creighton, Mary L. ....'06-'07	10 00	
Busch, Miers. ....'06-'07	10 00		Cresap, Philip P. ....'05-'06	10 00	
Byrød, John. ....'05	5 00		Crisswell, Francis M. ....'06	5 00	
Cadmus, Robert C. ....'06	5 00		Crook, Frank R. ....'06	5 00	
Calkins, Eleazer E. ....'07	5 00		Cross, Elias H. ....'06	5 00	
Cameron, Charles S. ....'06	5 00		Crouch, William T. ....'06	5 00	
Campbell, Albert A. ....'06-'07	10 00		Culbreth, David M. R. ....'05-'06	10 00	
Campbell, Charles B. ....'06	5 00		Culpepper, Thomas J. ....'06	5 00	
Campbell, George S. ....'06	5 00		Curry, David W. ....'06-'07	10 00	
Campbell, Milton. ....'06-'07	10 00		Cuthbert, Richard W. ....'06-'07	10 00	
Campbell, Theodore. ....'06	5 00		Cutler, Bertram C. ....'06	5 00	
Cantor, Lorenz. ....'07	5 00		Daboll, Horace H. ....'07	5 00	
Capdau, Pierre A. ....'06-'07	10 00		Daggett, V. Chapin. ....'06-'07	10 00	
Carpenter, William A. ....'06	5 00		Dahlin, Horace O. ....'06	5 00	
Carter, Frank H. ....'06	5 00		Danden, Raymond A. von. ....'06	5 00	
Carter, Frederick J. ....'05	5 00		Danek, John F. ....'06	5 00	
Case, George E. ....'06	5 00		Daneker, Howard N. ....'07	5 00	
Caspari, Charles, Jr. ....'07	5 00		Daniels, Wilbur W. ....'05	5 00	
Caspari, Charles E. ....'06-'07	10 00		Dare, Charles F. ....'06	5 00	
Cassaday, O. U. ....'06-'07	10 00		Davenport, Emmet H. ....'05	5 00	
Castillon, Louis A. ....'05-'06	10 00		Davis, Charles Henry. ....'07	5 00	
Chamberlin, William A. ....'06	5 00		Davis, Charles Howard. ....'06	5 00	
Chantler, Vincent H. ....'06	5 00		Davis, Charles L. ....'07	5 00	
Cheney, Arthur L. ....'07	5 00		Davis, Emma M. ....'06-'07	10 00	
Chisholm, Jesse C. ....'06	5 00		Dawson, Edw. S., Jr. ....'05-'06-'07	15 00	
Christensen, Henry C. ....'06	5 00		Deakynne, Harry H. ....'06-'07	10 00	
Christoph, George B. ....'05	5 00		De Barr, Edwin. ....'05	5 00	
Claffin, Walter A. ....'07	5 00		De Jonge, Cornelius. ....'05-'06	10 00	
Clapp, Lowell T. ....'06-'07	10 00		De Lorenzi, Albert. ....'06	5 00	
Clark, Albert H. ....'06	5 00		Deck, Lewis C. ....'07	5 00	
Clark Arthur B. ....'06	5 00		Decker, William R. ....'07	5 00	
Clark, John A. ....'06	5 00		Dewender, William H. ....'07	5 00	
Clarke, Charles J. ....'06	5 00		Dewoody, William L. ....'07	5 00	
Claus, Otto F. ....'05-'06	10 00		Diamond, Peter. ....'06	5 00	
Clayton, Abraham T. ....'06	5 00		Dickson, Fred. W. ....'06	5 00	
Clayton, Charles J. ....'05-'06	10 00		Diekman, George C. ....'07	5 00	
Clothier, C. Roland. ....'06	5 00		Dillenback, Garrett V. de V. ....'06	5 00	
Clough, Frank H. ....'05-'06	10 00		Dilly, Oscar C. ....'06-'07	10 00	
Cobb, Ralph L. ....'07	5 00		Dimmitt, Addison. ....'06-'07	10 00	
Coblentz, Virgil. ....'06	5 00		Dimond, Harry J. ....'07	5 00	
Cochran, William M. ....'06	5 00		Diner, Jacob. ....'06	5 00	
Coffman, Walter T. ....'05	5 00		Dinkler, Frank A. ....'06	5 00	
Amount carried forward.....	\$1170 00	\$40 00	Amount carried forward.....	\$1655 00	\$45 00

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward.....	\$1655 00	\$45 00	Amount brought forward.....	\$2135 00	\$45 00
Dissonay, Thurston N. '06-'07	10 00		Fleischner, Charles.....'07	5 00	
Dixon, J. Marion.....'07	5 00		Flemer, Lewis.....'06	5 00	
Donaberger, Samuel B. ....'06	5 00		Fletcher, David M.....'07	5 00	
Dort, Edward H.....'07	5 00		Flowers, Hiland.....'07-'08	10 00	
Dow, John P.....'06	5 00		Flynn, Cornelius P.....'06	5 00	
Downing, Benjamin F., Jr....'06	5 00		Forbes, J. Winchell.....'05-'06	10 00	
Drescher, August.....'06-'07	10 00		Ford, Charles M.....'05-'06-'07-'08	20 00	
Drew, Walter I.....'05-'06	10 00		Forsyth, William K.....'06	5 00	
Duble, Jesse B.....'05-'06-'07	15 00		Foster, John B.....'06	5 00	
Du Bois, William L.....'06	5 00		Fouch, William M.....'06	5 00	
Duncan, Chester A.....'06	5 00		Foulke, James.....'07	5 00	
Dunning, Lyman T.....'06	5 00		Fox, Willard M.....'06	5 00	
Durban, Sebastian C.....'04	5 00		Frailey, William O.....'06	5 00	
Dutt, William.....'06-'07	10 00		Frames, J. Fuller.....'06	5 00	
Earhart, Fred. A.....'05-'06	10 00		Francis, J. Richard.....'06	5 00	
Easterday, Herbert C.....'06	5 00		Francis, John M.....'06	5 00	
Eberbach, Ottmar.....'06	5 00		Franzoni, Joseph D.....'06	5 00	
Eberhardt, Ernest G.....'06	5 00		Fraser, Horatio N.....'06-'07	10 00	
Eberle, Eugene G.....'07	5 00		Frauer, Herman E.....'06	5 00	
Eberle, Herman T.....'06-'07	10 00		Freericks, Frank H.....'06	5 00	
Eberly, Frank H.....'07	5 00		French, Harry B.....'06-'07	10 00	
Eccles, Robert G.....'07	5 00		French, Howard B.....'06	5 00	
Eckert, John.....'06	5 00		Fricke, Frederick G.....'07	5 00	
Eckler, Charles R.....'06	5 00		Fricke, Frederick H.....'06	5 00	
Ehrlicher, Henry M.....'05-'06	10 00		Friedenburg, M. W.....'07	5 00	
Eichold, Bernard H.....'06	5 00		Frost, William A.....'06-'07	10 00	
Eichrodt, Mary F.....'06	5 00		Fry, Herman.....'06-'07	10 00	
Eldred, Frank R.....'06	5 00		Fry, Narcys C.....'06	5 00	
Elfstrand, Wilhelm.....'07	5 00		Frye, George C.....'06-'07	10 00	
Elhel, Leo.....'07	5 00		Gaesser, Theobald T.....'07	5 00	
Elkin, William S.....'06	5 00		Gahn, Henry.....'04-'05-'06-'07	20 00	
Elliott, Boyce.....'06	5 00		Gallenkamp, Edward W.....'06	5 00	
Elliott, Charles H.....'06	5 00		Galvin, Matthew.....'06-'07	10 00	
Elsner, Fred. H.....'06	5 00		Gamble, Stewart.....'06-'07	10 00	
Ely, Ernest S.....'06-'07	10 00		Gamer, Albert C. C.....'06	5 00	
Emanuel, Julia E. (Miss).....'06	5 00		Gammon, Irving P.....'06	5 00	
England, Joseph W.....'06	5 00		Gano, William H.....'06	5 00	
Enustrom, Ernst O.....'06	5 00		Ganez, William H.....'07	5 00	
Ennis, Ephraim L.....'06-'07	10 00		Garber, Elmer F. W.....'07	5 00	
Eppstein, Jacob.....'05-'06	10 00		Garrett, Oscar N.....'06	5 00	
Erck, Philip F.....'06	5 00		Garver, Christian.....'06	5 00	
Ernst, Frank F.....'04-'05-'06	15 00		Gaus, Charles H.....'07	5 00	
Estabrook, Henry A.....'05-'06	10 00		Gausby, Robert A.....'06	5 00	
Etsel, John L.....'05-'07	10 00		Gauthier, Charles D.....'06	5 00	
Evans, George B.....'06-'07	10 00		Gayle, John W.....'07	5 00	
Evans, William J.....'07	5 00		Geisler, Joseph F.....'06	5 00	
Eysenbach, Henry P.....'05-'06	10 00		Gerald, Herbert F.....'06	5 00	
Eyssel, George.....'06	5 00		Gertler, John H.....'06	5 00	
Faber, Walter E.....'06	5 00		Gessner, Emil A.....'07	5 00	
Fahrner, Alphonse A.....'06	5 00		Gibson, Robert H.....'06	5 00	
Fairchild, Benjamin T.....'07	5 00		Gietner, Charles.....'06	5 00	
Fairchild, Samuel W.....'07	5 00		Gilpin, Henry B.....'07	5 00	
Falk, John C.....'06-'07	10 00		Ginocchio, James A.....'06	5 00	
Federmann, William M.....'07	5 00		Glass, William F.....'05-'06-'07	15 00	
Feick, Charles.....'06	5 00		Gleason, Patrick S.....'06	5 00	
Feidt, George D.....'06	5 00		Gleghorn, James S.....'05-'06	10 00	
Feil, Joseph.....'06	5 00		Glover, William H.....'06	5 00	
Feindt, Louis E.....'06	5 00		Godbold, Fabius C.....'06	5 00	
Fennel, Charles T. P.....'06	5 00		Godding, John G.....'07	5 00	
Ferger, Edward.....'06	5 00		Goldsborough, Charles H.....'06	5 00	
Fickhardt, Fred. L.....'06	5 00		Goodman, J. Hawkins.....'05-'06-'07	15 00	
Fieber, Gustavus A.....'06	5 00		Gordin, Harry M.....'07	5 00	
Field, Claud.....'06	5 00		Gorlon, Jean.....'06	5 00	
Finch, Charles S.....'06	5 00		Gordon, William C.....'06	5 00	
Fink, Daniel J.....'07	5 00		Gorgas, George A.....'07	5 00	
Finnenger, Paul E.....'06	5 00		Grace, William D.....'07	5 00	
Finneran, James F.....'06	5 00		Graham, Charles R.....'06	5 00	
Finney, John J.....'06	5 00		Gram, William J. B.....'05	5 00	
Fischer, Albert.....'06	5 00		Grassly, Charles W.....'06	5 00	
Fischer, Henry J.....'06-'07	10 00		Gray, Margaret McC.....'06-'07	10 00	
Fischer, Richard.....'06-'07	10 00		Gray, William.....'06-'07	10 00	
Fischnar, John F.....'06	5 00		Green, Arthur L.....'06-'07	10 00	
Fisher, George W.....'07	5 00		Green, Benjamin.....'07	5 00	
Fisk, Frank E.....'06	5 00		Green, Carl V.....'06	5 00	
Flack, Herbert L.....'05	5 00		Green, Edward T.....'06	5 00	
Amount carried forward.....	\$2135 00	\$45 00	Amount carried forward.....	\$2625 00	\$45 00

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward.....	\$720 00	\$32 50	Amount brought forward.....	\$1170 00	\$40 00
Boyd, George W. ....06	5 00		Cohn, Alfred I. ....06	5 00	
Brack, Charles E. ....07	5 00		Colby, Charles L. ....07	5 00	
Bradbury, Wymond H. ....06	5 00		Cole, Victor L. ....06	5 00	
Bradley, Theodore J. ....07	5 00		Coleman, John. ....07	5 00	
Bradt, Warren T. ....06	5 00		Coleman, John H. ....06-07	10 00	
Brand Joseph H. ....05-06	10 00		Collier, William K. ....05-06	10 00	
Brandis, Ernest L. ....06	5 00		Collins, Albert B. ....06	5 00	
Brashear, Owen L. ....06	5 00		Collins, Frank A. ....06	5 00	
Brenner, George F. ....06	5 00	7 50	Collins, John L. ....06	5 00	
Breslin, Michael T. ....06	5 00		Collins, John S. ....06	5 00	
Bretsch, John L. ....06	5 00		Collins, Mary E. ....06-07	10 00	
Brickman, Arthur O. ....06	5 00		Compton, Paul. ....06	5 00	
Briggs, Andrew G. ....06	5 00		Congdon, George G. ....07	5 00	
Brinker, John H. ....06	5 00		Conger, Stephen B. ....07	5 00	
Brookes, Virginia C. ....06	5 00		Conzet, Rufus W. ....07	5 00	
Brooks, George W. ....06	5 00		Coody, Archibald S. ....06	5 00	
Brown, Edward P. ....06	5 00		Cook, Alfred P. ....06-07	10 00	
Brown, George S. ....04	5 00		Cook, Elliot D. ....06-07	10 00	
Brown, John C. ....06	5 00		Cook, E. Fullerton. ....06-07	10 00	
Brown, J. Lee. ....06	5 00		Cook, Thomas P. ....06	5 00	
Brucker, Carl. ....07	5 00		Coonley, Charles. ....06	5 00	
Brundage, Albert H. ....06	5 00		Coons, William J. ....06	5 00	
Brunn, Harold N. ....06	5 00		Cormick, John W. ....06	5 00	
Huckner, John C. ....06	5 00		Cornell, Edward A. ....06	5 00	
Bunnell, Lynn L. ....06	5 00		Corning, Albion J. ....07	5 00	
Buntin, William C. ....06	5 00		Côté, André A. ....05-06	10 00	5 00
Burg, John D. ....06-07	10 00		Coulson, James T. ....06	5 00	
Burgheim, Jacob. ....06	5 00		Covington, Samuel M. ....06	5 00	
Burke, William H. ....07	5 00		Cowan, John. ....04-05	10 00	
Hurke, William T. ....06	5 00		Cramer, Max. ....06-07	10 00	
Burnham, Alfred A., Jr. ....07	5 00		Crawford, Claude M. ....06	5 00	
Burnham, Ralph F. ....07	5 00		Crawford, Frank E. ....06	5 00	
Burrough, Horace. ....05-06	10 00		Crawford, Joseph. ....06	5 00	
Burrough, Horace, Jr. ....05-06	10 00		Creighton, Mary L. ....06-07	10 00	
Busch, Miers. ....06-07	10 00		Cresap, Philip P. ....05-06	10 00	
Hyrud, John. ....05	5 00		Criswell, Francis M. ....06	5 00	
Cadmus, Robert C. ....06	5 00		Crook, Frank R. ....06	5 00	
Calkins, Eleazer E. ....07	5 00		Cross, Elias H. ....06	5 00	
Cameron, Charles S. ....06	5 00		Crouch, William T. ....06	5 00	
Campbell, Albert A. ....06-07	10 00		Culbreth, David M. R. ....05-06	10 00	
Campbell, Charles B. ....06	5 00		Culpepper, Thomas J. ....06	5 00	
Campbell, George S. ....06	5 00		Curry, David W. ....06-07	10 00	
Campbell, Milton. ....06-07	10 00		Cuthbert, Richard W. ....06-07	10 00	
Campbell, Theodore. ....06	5 00		Cutler, Bertram C. ....06	5 00	
Cantor, Lorenz. ....07	5 00		Daboll, Horace H. ....07	5 00	
Capdau, Pierre A. ....06-07	10 00		Daggett, V. Chapin. ....06-07	10 00	
Carpenter, William A. ....06	5 00		Dahlin, Horace O. ....06	5 00	
Carter, Frank H. ....06	5 00		Danden, Raymond A. von. ....06	5 00	
Carter, Frederick J. ....05	5 00		Danek, John F. ....06	5 00	
Case, George E. ....06	5 00		Daneker, Howard N. ....07	5 00	
Caspari, Charles, Jr. ....07	5 00		Daniels, Wilbur W. ....05	5 00	
Caspari, Charles E. ....06-07	10 00		Dare, Charles F. ....06	5 00	
Cassaday, O. U. ....06-07	10 00		Davenport, Emmet H. ....05	5 00	
Castillon, Louis A. ....05-06	10 00		Davis, Charles Henry. ....07	5 00	
Chamberlin, William A. ....06	5 00		Davis, Charles Howard. ....06	5 00	
Chantler, Vincent H. ....06	5 00		Davis, Charles L. ....07	5 00	
Cheney, Arthur L. ....07	5 00		Davis, Emma M. ....06-07	10 00	
Chisholm, Jesse C. ....06	5 00		Dawson, Edw. S., Jr. ....05-06-07	15 00	
Christensen, Henry C. ....06	5 00		Deakynne, Harry H. ....06-07	10 00	
Christoph, George B. ....05	5 00		De Barr, Edwin. ....05	5 00	
Clafin, Walter A. ....07	5 00		De Jonge, Cornelius. ....05-06	10 00	
Clapp, Lowell T. ....06-07	10 00		De Lorenzi, Albert. ....06	5 00	
Clark, Albert H. ....06	5 00		Deck, Lewis C. ....07	5 00	
Clark Arthur B. ....06	5 00		Decker, William R. ....07	5 00	
Clark, John A. ....06	5 00		Dewender, William H. ....07	5 00	
Clarke, Charles J. ....06	5 00		Dewoody, William L. ....07	5 00	
Claus, Otto F. ....05-06	10 00		Diamond, Peter. ....06	5 00	
Clayton, Abraham T. ....06	5 00		Dickson, Fred W. ....06	5 00	
Clayton, Charles J. ....05-06	10 00		Diekman, George C. ....07	5 00	
Clothier, C. Roland. ....06	5 00		Dillenback, Garrett V. de V. ....06	5 00	
Clough, Frank H. ....05-06	10 00		Dilly, Oscar C. ....06-07	10 00	
Cobb, Ralph L. ....07	5 00		Dimmitt, Addison. ....06-07	10 00	
Coblentz, Virgil. ....06	5 00		Dimond, Harry J. ....07	5 00	
Cochran, William M. ....06	5 00		Diner, Jacob. ....06	5 00	
Coffman, Walter T. ....05	5 00		Dunkler, Frank A. ....06	5 00	
Amount carried forward.....	\$1170 00	\$40 00	Amount carried forward.....	\$1655 00	\$45 00

ALPHABETICAL LIST OF PAYMENTS.

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	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward.....	\$1655 00	\$45 00	Amount brought forward.....	\$2135 00	\$45 00
Dissosnay, Thurston N. '06-'07	10 00		Fleischner, Charles.....'07	5 00	
Dixon, J. Marion.....'07	5 00		Flemer, Lewis.....'06	5 00	
Donaberger, Samuel B. ....'06	5 00		Fletcher, David M.....'07	5 00	
Dort, Edward H.....'07	5 00		Flowers, Hiland.....'07-'08	10 00	
Dow, John P.....'06	5 00		Flynn, Cornelius P.....'06	5 00	
Downing, Benjamin F., Jr.....'06	5 00		Forbes, J. Winchell.....'05-'06	10 00	
Drescher, August.....'06-'07	10 00		Ford, Charles M.....'05-'06-'07-'08	20 00	
Drew, Walter I.....'05-'06	10 00		Forsyth, William K.....'06	5 00	
Duble, Jesse B.....'05-'06-'07	15 00		Foster, John B.....'06	5 00	
Du Bois, William L.....'06	5 00		Fouch, William M.....'06	5 00	
Duncan, Chester A.....'06	5 00		Foulke, James.....'07	5 00	
Dunning, Lyman T.....'06	5 00		Fox, Wilard M.....'06	5 00	
Durban, Sebastian C.....'04	5 00		Frabley, William O.....'06	5 00	
Dutt, William.....'06-'07	10 00		Frames, J. Fuller.....'06	5 00	
Earhart, Fred. A.....'05-'06	10 00		Francis, J. Richard.....'06	5 00	
Easterday, Herbert C.....'06	5 00		Francis, John M.....'06	5 00	
Eberbach, Ottmar.....'06	5 00		Franzoni, Joseph D.....'06	5 00	
Eberhardt, Ernest G.....'06	5 00		Fraser, Horatio N.....'06-'07	10 00	
Eberle, Eugene G.....'07	5 00		Fraser, Herman E.....'06	5 00	
Eberle, Herman T.....'06-'07	10 00		Freericks, Frank H.....'06	5 00	
Eberly, Frank H.....'07	5 00		French, Harry B.....'06-'07	10 00	
Eccles, Robert G.....'07	5 00		French, Howard B.....'06	5 00	
Eckert, John.....'06	5 00		Fricke, Frederick G.....'07	5 00	
Eckler, Charles R.....'06	5 00		Fricke, Frederick H.....'06	5 00	
Ehrlicher, Henry M.....'05-'06	10 00		Friedenburg, M. W.....'07	5 00	
Eichold, Bernard H.....'06	5 00		Frost, William A.....'06-'07	10 00	
Eichrodt, Mary E.....'06	5 00		Fry, Herman.....'06-'07	10 00	
Eldred, Frank R.....'06	5 00		Fry, Narcys C.....'06	5 00	
Elfstrand, Wilhelm.....'07	5 00		Frye, George C.....'06-'07	10 00	
Eliel, Leo.....'07	5 00		Gaesser, Theobald T.....'07	5 00	
Elkin, William S.....'06	5 00		Gahn, Henry.....'04-'05-'06-'07	20 00	
Elliott, Boyce.....'06	5 00		Gallenkamp, Edward W.....'06	5 00	
Elliott, Charles H.....'06	5 00		Galvin, Matthew.....'06-'07	10 00	
Elstner, Fred. H.....'06	5 00		Gamble, Stewart.....'06-'07	10 00	
Ely, Ernest S.....'06-'07	10 00		Gamer, Albert C. C.....'06	5 00	
Emanuel, Julia E. (Miss).....'06	5 00		Gammon, Irving P.....'06	5 00	
England, Joseph W.....'06	5 00		Gano, William H.....'06	5 00	
Engstrom, Ernst O.....'06	5 00		Ganez, William H.....'07	5 00	
Ennis, Ephraim L.....'06-'07	10 00		Garber, Elmer F. W.....'07	5 00	
Eppstein, Jacob.....'05-'06	10 00		Garrett, Oscar N.....'06	5 00	
Erck, Philip F.....'06	5 00		Garver, Christian.....'06	5 00	
Ernst, Frank F.....'04-'05-'06	15 00		Gaus, Charles H.....'07	5 00	
Estabrook, Henry A.....'05-'06	10 00		Gausby, Robert A.....'06	5 00	
Etsel, John L.....'05-'07	10 00		Gauthier, Charles D.....'06	5 00	
Evans, George B.....'06-'07	10 00		Gayle, John W.....'07	5 00	
Evans, William J.....'07	5 00		Geisler, Joseph F.....'06	5 00	
Eysenbach, Henry P.....'05-'06	10 00		Gerald, Herbert F.....'06	5 00	
Eyssel, George.....'06	5 00		Gertler, John H.....'06	5 00	
Faber, Walter E.....'06	5 00		Gessner, Emil A.....'07	5 00	
Fahrner, Alphonse A.....'06	5 00		Gibson, Robert H.....'06	5 00	
Fairchild, Benjamin T.....'07	5 00		Gietner, Charles.....'06	5 00	
Fairchild, Samuel W.....'07	5 00		Gilpin, Henry B.....'07	5 00	
Falk, John C.....'06-'07	10 00		Ginocchio, James A.....'06	5 00	
Federmann, William M.....'07	5 00		Glass, William F.....'05-'06-'07	15 00	
Feick, Charles.....'06	5 00		Gleason, Patrick S.....'06	5 00	
Feidt, George D.....'06	5 00		Gleghorn, James S.....'05-'06	10 00	
Feil, Joseph.....'06	5 00		Glover, William H.....'06	5 00	
Feindt, Louis E.....'06	5 00		Godbold, Fabus C.....'06	5 00	
Fennel, Charles T. P.....'06	5 00		Godding, John G.....'07	5 00	
Ferger, Edward.....'06	5 00		Goldsborough, Charles H.....'06	5 00	
Fickhardt, Fred. L.....'06	5 00		Goodman, J. Hawkins.....'05-'06-'07	15 00	
Fieber, Gustavus A.....'06	5 00		Gordin, Harry M.....'07	5 00	
Field, Claud.....'06	5 00		Gor-ion, Jean.....'06	5 00	
Finch, Charles S.....'06	5 00		Gordon, William C.....'06	5 00	
Fink, Daniel J.....'07	5 00		Gorgas, George A.....'07	5 00	
Finnenger, Paul E.....'06	5 00		Grace, William D.....'07	5 00	
Finneran, James F.....'06	5 00		Graham, Charles R.....'06	5 00	
Finney, John J.....'06	5 00		Gram, William J. B.....'05	5 00	
Fischer, Albert.....'06	5 00		Grassly, Charles W.....'06	5 00	
Fischer, Henry J.....'06-'07	10 00		Gray, Margaret McC.....'06-'07	10 00	
Fischer, Richard.....'06-'07	10 00		Gray, William.....'06-'07	10 00	
Fischnar, John F.....'06	5 00		Green, Arthur L.....'06-'07	10 00	
Fisher, George W.....'07	5 00		Green, Benjamin.....'07	5 00	
Fisk, Frank E.....'06	5 00		Green, Carl V.....'06	5 00	
Flack, Herbert L.....'05	5 00		Green, Edward T.....'06	5 00	
Amount carried forward.....	\$2135 00	\$45 00	Amount carried forward.....	\$2625 00	\$45 00

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward.....	\$4425 00	\$87 50	Amount brought forward.....	\$4950 00	\$95 00
Mason, Harry B. '06	5 00		Morgan, Aylmer L. '06-'07	10 00	
Mason, Myron R. '06-'07	10 00		Morgan, Charles '05	5 00	
Mathison, Soren '06	5 00		Morgan, Frank E. '06	5 00	
Matousek, Joseph T. '05-'06	10 00		Morgan, Thomas, Jr. '06	5 00	
Matthews, Charles E. '07	5 00		Morrison, George S. '06	5 00	
Matusow, Harry '06-'07	10 00		Morse, Edward W. '07	5 00	
Maxwell, Charles C. '06	5 00		Morse, Frank D. '07	5 00	
May, Charles C. '06	5 00		Mosher, William W. '06-'07	10 00	
May, Louis '07	5 00		Motter, Murray G. '06	5 00	
Mayer, Joseph L. '07	5 00		Moxley, Roland R. '07	5 00	
Mayer, Peter '06-'07	10 00		Moyer, Lewis N. '04-'05-'06	15 00	
Mayo, Caswell A. '06	5 00		Mrazek, Leo L. '06	5 00	
McArthur, James W. '06	5 00		Mueller, J. George '06	5 00	
McBride, Charles R. '06	5 00		Muench, William '07	5 00	
McCauley, Charles E. '06	5 00		Muir, John D. '05-'06	10 00	
McCluggage, John J. '05-'06	10 00		Mulford, Henry K. '06-'07	10 00	
McClure, Ulysses G. '06	5 00		Murbach, John E. '05	5 00	
McCombie, James N. '06	5 00		Murray, Alexander '06	5 00	
McConaughy, Thomas S. '06-'07	10 00		Murray, Benjamin L. '05-'06-'07	15 00	
McConnell, Charles H. '07	5 00		Musselman, Claude J. '06	5 00	
McConnell, Lewis W. '07	5 00		Muth, George G. '06-'07	10 00	
McConomy, Paul L. '06	5 00		Muth, George L. '07	5 00	
McDonald, Harry S. '06-'07	10 00		Muth, John C. '07	5 00	
McElhenie, Thomas D. '06	5 00		Muth, John S. '07	5 00	
McFerren, J. D. '06	5 00		Myers, Carlosso O. '06	5 00	
McGill, John T. '07	5 00		Myers, Charles J. '05	5 00	
McGovern, John F. '06	5 00	7 50	Myers, Preston B. '06-'07	10 00	
McKay, Felix E. '06	5 00		Myerson, Isaac A. '06-'07	10 00	
McKesson, Donald '06-'07	10 00		Napp, William G. '06-'07	10 00	
McKesson, G. Clinton '06	5 00		Neal, Charles C. '06	5 00	
McKinney, Robert S. '04-'05	10 00		Neal, Thomas L. '06	5 00	
McKown, Joseph O. '06	5 00		Nebig, William G. '07	5 00	
McLarty, Colin '05-'06-'07	15 00		Needham, Robert H. '06	5 00	
McMahon, Joseph '07	5 00		Neeley, Guy M. '06	5 00	
McNair, John S. '05-'06	10 00		Neil, John G. '05	5 00	
McNess, Frederick W. '06-'07	10 00		Nelson, Burt E. '06-'07	10 00	
McQuillen, Francis '06	5 00		Nelson, Edwin H. '07	5 00	
McVay, Ernest A. '06	5 00		Neu, D. Alfred '06	5 00	
Meeker, George H. '06-'07	10 00		Neves, George '05	5 00	
Meissner, Frederick W., Jr. '06	5 00		Newcomb, Edwin L. '06	5 00	
Meixner, Fred. M. F. '06	5 00		Newton, R. Albion '06-'07	10 00	
Menk, Charles W. '06	5 00		Nie, Henry J. '05-'06	10 00	5 00
Mente, Alvin W. '06	5 00		Niece, Frederic E. '06	5 00	
Mentzer, Harvey H. '06	5 00		Nielson, John '07	5 00	
Mercer, William E. '04-'05-'06	15 00		Niethammer, Otto F. '05	5 00	
Meredith, H. Lionel '06	5 00		Nittardy, Ferdinand '05-'06	10 00	
Merrell, Charles G. '07	5 00		Nixon, Charles F. '06-'07	10 00	
Merrell, George '07	5 00		Noll, Martin J. '06	5 00	
Merrell, George R. '06	5 00		Noll, Mathias '06	5 00	
Merrell, Hubert S. '07	5 00		Norton, George E. '06-'07	10 00	
Mertz, Edward L. '06	5 00		O'Connell, Charles J. '07	5 00	
Meserve, Albert W. '06	5 00		O'Gorman, Theophilus V. '07	5 00	
Metzger, Matthias C. '06	5 00		O'Hare, James '07	5 00	
Meyer, Adolph C. '07	5 00		O'Neil, Henry M. '07	5 00	
Meyer, Martin M. '07	5 00		Oettinger, Albert '06-'07	10 00	
Meyer, Theodore F. '07	5 00		Oglesby, George D. '06	5 00	
Millard, David R. '06	5 00		Ohliger, Willard '06	5 00	
Miller, Emerson R. '06	5 00		Oliver, Frank M. '06	5 00	
Miller, Frederick J. '06	5 00		Orear, Edwin G. '06-'07	10 00	
Miller, F. William '06	5 00		Ortenstein, Harry M. '06	5 00	
Miller, Jacob A. '06	5 00		Orton, Ingomar F. '07	5 00	
Miller, Roshier W. '06	5 00		Osborne, Melmoth M. '06	5 00	
Milligan, John D. '05-'06	10 00		Osseward, Cornelius '06	5 00	
Minehart, John R. '06	5 00		Osterlund, Otto W. '06-'07	10 00	
Miner, Maurice A. '06	5 00		Ottinger, James J. '06-'07	10 00	
Minesinger, Norman M. '06-'07	10 00		Otto, Theodore G. E. '07	5 00	
Mittermiller, John A. '06	5 00		Overbeck, Bernard H., Jr. '06-'07	10 00	
Mittelbach, William '07	5 00		Overstreet, Wm. P. '98-'07	50 00	
Mix, Willis L. '06-'07	10 00		Overton, Burr M. '06-'07	10 00	
Moerk, Frank X. '06-'07	10 00		Pachali, Theodore, Jr. '07	5 00	
Mohler, David C. '06-'07	10 00		Packard, Charles H. '06	5 00	
Monaghan, Thomas F. '06-'07	10 00		Paddock, Morris V. '06	5 00	
Monsabert, Arthur C., de. '06	5 00		Paine, E. Fernandez '06	5 00	
Moore, John T. '06	5 00		Palmer, J. Dabney '07	5 00	
Moore, Silas H. '06	5 00		Parisen, George W. '04-'05	10 00	
Amount carried forward.....	\$4910 00	\$95 00	Amount carried forward.....	\$5455 00	\$100 00

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward	\$5455 00	\$100 00	Amount brought forward	\$5940 00	\$107 50
Partridge, Frank R. '06	5 00		Roehrig, Albert M. '06	5 00	
Patch, Edgar L. '06	5 00		Roemer, Frederick '05-'06	10 00	7 50
Patch, James A. '06	5 00		Rogers, Arthur H. '06	5 00	
Patterson, Charles M. '06-'07	10 00		Rogers, Edward '06	5 00	
Patterson, Charles W. '06	5 00		Rogers, William H. '06	5 00	
Pauley, Frank C. '06	5 00		Roll, Todd B. '06	5 00	
Payne, George F. '06-'07	10 00		Rosengarten, George D. '06	5 00	
Peacock, Bertha L. (Mrs.) '06	5 00		Rosenthal, David A. '07	5 00	
Peacock, Josiah C. '06	5 00		Rosenthal, Joseph '06	5 00	
Pearre, Albert L. '06	5 00		Rosenzweig, Benjamin '07	5 00	
Pearson, Joseph F. '07	5 00		Roth, Charles R. '06	5 00	
Pease, Autumn V. '07	5 00		Rounds, Marvin B. C. '06	5 00	
Perkins, Benjamin A. '07	5 00		Roush, Frederick A. '07	5 00	
Perry, Clifford H. '06	5 00		Rowles, Walter D. '05	5 00	
Perry, Frederick W. R. '06	5 00		Rowlinski, Robert A. '06	5 00	
Peter, Minor C. '06-'07	10 00		Rozanski, Boleslaus J. '06	5 00	
Peters, Henry A. '06	5 00		Rozene, Robert P. M. '06	5 00	
Petsche, Bismarck W. '06	5 00		Ruddiman, Edsel A. '06	5 00	
Petterson, Ernest W. '05-'06	10 00		Ruhl, Harry F. '06	5 00	
Pfaff, Franz '07	5 00		Runkel, Julia (Miss) '06	5 00	
Pfafflin, Henry A. '06-'07	10 00		Rusby, Henry H. '06-'07	10 00	
Phillips, Carrie E. (Miss) '06-'07	10 00		Russell, Hamilton '06-'07	10 00	
Pierce, Olive B. (Miss) '06	5 00		Rust, Schuyler. '07	5 00	
Pitt, John R. '06	5 00		Ryan, Frank G. '07	5 00	
Pitts, William B. '04-'05-'06	15 00		Saalbach, Louis '07	5 00	
Placak, Harry '07	5 00		Sabin, George C. '06	5 00	
Plaut, Albert '07	5 00		Saccar, Michael '06-'07	10 00	
Poley, Warren H. '06	5 00		Sadtler, Samuel P. '06-'07	10 00	
Pollard, Augustus T. '06	5 00		Saichert, Herman A. '06	5 00	
Porter, Chilton S. '06	5 00		Sahn, Louis N. '06-'07	10 00	
Porter, George M. '06	5 00		Samson, Max '06-'07	10 00	
Porter, William H. '06	5 00		Sarradet, Atal A. '06	5 00	
Potter, Maynard H. '06	5 00		Sass, Stephen K. '05-'06-'07	15 00	7 50
Potts, David G. '06-'07	10 00		Sauvinet, Charles D. '06-'07	10 00	
Potts, Thomas H. '06	5 00		Sawyer, Charles H. '07	5 00	
Powell, William C. '06-'07	10 00		Sawyer, Hilon H. '06	5 00	
Prall, Delbert E. '07	5 00		Sawyer, William F. '05-'06	10 00	
Pratt, Thomas M. '06	5 00		Sayers, Milton C. '06	5 00	
Price, Charles H. '07	5 00		Savre, Edward A. '06	5 00	
Price, Joseph '07	5 00		Sayre, Lucius E. '07	5 00	
Printup, Daniel '04-'05-'06	15 00		Scallin, Stephen H. '06	5 00	
Puckner, William A. '07	5 00		Schaa, Milton F. '06	5 00	
Quackinbush, Benjamin F. '07	5 00		Schachleiter, Francis G. '06	5 00	
Quales, Iver L. '05	5 00		Schadt, Conrad '07	5 00	
Queeney, John F. '07	5 00		Schaefer, Emil A. '07	5 00	
Quigley, Richard L. '06	5 00		Schaefer, George H. '04-'07	20 00	
Quirk, Edmond C., Jr. '05-'06	10 00		Schanher, Paul '05	5 00	
Randall, Frank O. '06	5 00		Scheips, Theodor I. '05-'06	10 00	
Raubenheimer, Otto '06-'07	10 00		Schellentrager, Ernst A. '06	5 00	
Rauschenberg, Sidney '05-'06	10 00		Schenck, Henry '06-'07	10 00	
Redecker, Jacob H. '07	5 00		Schenk, Fannie K. (Mrs.) '06	5 00	
Reese, David J. '06-'07	10 00		Scherer, Andrew '07	5 00	
Reid, William W. '06	5 00	7 50	Scheuber, Frank A. '07	5 00	
Reilly, Robert C. '06-'07	10 00		Schiemann, Edward B. '06	5 00	
Reimann, George '06	5 00		Schimmel, Maurice S. '06	5 00	
Renfro, Harris B. '06-'07	10 00		Schlabach, Edward J. '05-'06	10 00	
Renshaw, Millicent S. '06-'07	10 00		Schleusner, Charles F. '06-'07	10 00	
Rex, Clarence R. '05	5 00		Schlosser, Peter '06-'07	10 00	
Rice, Ivan S. '06	5 00		Schlotterbeck, Augustus G. '07	5 00	
Rich, W. Pitt. '07	5 00		Schlueter, Robert E. '07	5 00	
Richard, Vallex B. '06	5 00		Schmid, Henry '06	5 00	
Richardson, Frank '06	5 00		Schmidt, Florian C. '07	5 00	
Richardson, Samuel W. '06	5 00		Schmidt, Florian J. '06	5 00	
Richardson, Willard S. '06	5 00		Schmidt, Frederick M. '07	5 00	
Richtmann, William O. '06	5 00		Schmidt, Henry '07	5 00	
Riddell, Benjamin F. '06	5 00		Schmidt, Walter K. '06-'07	10 00	
Riegel, Samuel J. '05-'06	10 00		Schmitt, Carl '06	5 00	
Riemenschneider, Julius H. '06	5 00		Schmitter, Jonathan '06	5 00	
Riley, Russell '06	5 00		Schneider, Carl H. '06	5 00	
Ringer, Charles E. '06	5 00		Schnell, Harry J. '06	5 00	
Ritter, Clyde '06	5 00		Schoenhut, Christie H. '07	5 00	
Robertson, Felix O. '06	5 00		Schoenthaler, John P. '06-'07	10 00	
Robinson, Willm J. M. '06-'07	10 00		Schoettlin, Albert J. '06-'07	10 00	
Rodemoyer, William F. '06	5 00		Schreiber, August '06	5 00	
Roe, J. Newton '06-'07	10 00		Schreiner, Louis I. '05	5 00	
Amount carried forward	\$5940 00	\$107 50	Amount carried forward	\$6425 00	\$122 50

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward.....	\$6425 00	\$122 50	Amount brought forward.....	\$6915 00	\$137 50
Schreiner, Oswald.....	06 00		Sparks, James M.....	06 00	
Schreiner, Robert.....	06-07 10 00	7 50	Spater, William C.....	05 00	
Schrodt, Jacob.....	06 00		Sprague, Wesson G.....	07 00	
Schuh, Paul G.....	07 00		Squibb, Charles F.....	06 00	
Schultz, John J.....	07 00		Staehle, Louis L.....	06 00	
Schulz, Henry L.....	06 00		Stahl, Amanda W. (Miss).....	07 00	
Schumann, Otto G.....	07 00		Stahlhuth, Ernest H. W.....	05-06 10 00	
Schwartz, Maurice P.....	06 00		Stamford, William H.....	06 00	
Schweitzer, Joseph.....	06 00		Stanbarger, Morris H.....	06 00	
Scotfield, J. Walker.....	05-06 10 00		Stanislaus, I. V. Stanley.....	06 00	
Scopp, Otto.....	06 00		Staudt, Louis C.....	06 00	
Scott, Alexander W.....	06 00		Stearns, Frederick.....	07 00	
Scott, Edgar B.....	06-07 10 00		Stearns, Cletus O.....	06 00	
Scott, George T.....	05-06 10 00		Steinmeyer, William O.....	07 00	
Scott, William H.....	07 00		Stenbuck, Moses A.....	07 00	
Scoville, Wilbur L.....	07 00		Stephenson, John J.....	06 00	
Seaman, Frederick A.....	07 00		Stevens, Alviso B.....	06 00	
Sears, Charles B.....	06-07 10 00		Stevens, Edward.....	06 00	
Seinsoth, John J.....	06 00		Stevens, Frederick S.....	07 00	
Seitz, Lorenz A.....	07 00		Stewart, Alexander.....	07 00	
Selzer, Eugene R.....	07 00		Stewart, Ernest F.....	06 00	
Sennwald, Emil A.....	07 00		Stewart, Francis E.....	06 00	
Serodino, Herman.....	06-07 10 00		Stichel, William K.....	07 00	
Seymour, James.....	04-05 10 00		Stimson, Charlotte E.....	06 00	
Shaak, Franklin P.....	06-07 10 00	7 50	Stille, Henry J.....	06 00	
Shafer, Erwin C.....	06-07 10 00		Storer, Charles A.....	06 00	
Shannon, Thomas J.....	06 00		Stott, Samuel T.....	06 00	
Sharples, Stephen P.....	06-07-08 15 00		Stoughton, Dwight G.....	07 00	
Sherman, Charles R.....	07 00		Stout, Marion A.....	06-07 10 00	
Sherrard, Charles C.....	04-05-06 15 00		Stowell, Daniel.....	04-05 10 00	
Sherriff, William E.....	06 00		Strickland, Franklin N.....	06 00	7 50
Shimer, Samuel M.....	07 00		Stringer, Orum H.....	06-07 10 00	
Shinnick, Joseph R.....	06 00		Stroup, Freeman P.....	06-07 10 00	
Shoemaker, Clayton F.....	06-07 10 00		Stuchlik, John.....	06 00	
Shoults, Robert G.....	05-06 10 00		Stutzlen, Frank C.....	06 00	
Shreve, John A.....	06-07 10 00		Sum, Francis.....	06 00	
Shudrowitz, Frank S.....	06 00		Swain, Harry.....	06 00	
Shurtleff, Willard C.....	05-06 10 00		Swearingen, De Witt C.....	07 00	
Siegenthaler, Harvey N.....	06 00		Sweet, Caldwell.....	07 00	
Sieker, Ferdinand A.....	06 00		Sweet, William H.....	07 00	
Sieplin, Charles A.....	06 00		Symonds, Arthur H.....	06 00	
Sievers, Arthur.....	06 00		Takamine, Jokichi.....	07 00	
Simmons, Gustav T.....	06 00		Taylor, Augustus C.....	06 00	
Simon, William.....	07 00		Taylor, George E.....	06-07 10 00	
Simson, Francis C.....	06 00		Taylor, Henry L.....	06 00	
Skeels, Howard M.....	07 00		Teeters, Wilbur J.....	07 00	
Slade, Harry A.....	07 00		Terrill, Willis E.....	05-06 10 00	
Slater, Frank H.....	06 00		Thames, Joseph J.....	06 00	
Sloss, Robert A.....	07 00		Thelander, Chreston C.....	06 00	
Smith, Albert H.....	06-07 10 00		Thomas, Daniel J.....	06 00	
Smith, Clarence P.....	06 00		Thomas, John B.....	06-07 10 00	
Smith, Edward W.....	06 00		Thomas, Oscar B.....	07 00	
Smith, Harley E.....	06 00		Thomas, Robert, Jr.....	07 00	
Smith, Lauriston S.....	07 00		Thompson, Albert D.....	07 00	
Smith, I. Inville H.....	06 00		Thompson, Leon J.....	07 00	
Smith, Owen C.....	06 00		Thornburn, Albert D.....	07 00	
Smith, Ralph N.....	06 00		Thorn, Henry P.....	07 00	
Smith, Theodric.....	06 00		Thum, John K.....	06 00	
Smith, Walter V.....	06-07 10 00		Thurston, Azor.....	06 00	
Smith, Willard A.....	07 00		Thurston, Edwin J.....	07 00	
Snow, Charles W.....	07 00		Tielke, Maxwell G.....	06 00	
Snow, Clyde M.....	06 00		Tilden, A. K., Estate of.....	04-05-06 15 00	
Snow, Herbert W.....	06 00		Tilton, Claude E.....	05 00	
Snow, Levi M.....	06-07 10 00		Timberlake, Arthur.....	06 00	
Sohrbeck, G. Henry.....	07 00		Tobin, John M.....	06 00	
Sohrbeck, George W.....	07 00		Topping, Arthur E.....	06-07 10 00	
Solomons, Isaiah A.....	07 00		Torbert, Willard H.....	07 00	
Sombart, John F.....	06 00		Toulson, Milbourne A.....	07 00	
Sords, Thomas V.....	06 00		Treadwell, William P.....	06 00	
Sorency, Robert.....	04-05 10 00		Treat, Joseph A.....	07 00	
Soult, Roy M.....	05-06 15 00		Tripp, Arthur H.....	06 00	
Southard, Frank A.....	06 00		Troxler, Constantine, Jr.....	06-07 10 00	
Spalding, Warren A.....	07 00		Truax, Charles.....	06 00	
Spangler, Lewis C.....	06 00		True, Rodney H.....	05 00	
Spangler, Newton L.....	06 00		Truedson, Eric P.....	06-07 10 00	
Amount carried forward.....	\$6915 00	\$137 50	Amount carried forward.....	\$7355 00	\$145 00

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward.....	\$7355 00	\$145 00	Amount brought forward.....	\$7775 00	\$150 00
Turner, Joseph L.....	06 5 00		Westcott, James W.....	06 5 00	
Tuthill, Frederick P.....	07 5 00		Wetterstroem, Albert.....	06 5 00	
Uhlich, Ferdinand G.....	07 5 00		Wetterstroem, Theodore D.....	07 5 00	
Utech, P. Henry.....	07 5 00		Weydell, K. Albus.....	06 5 00	
Valentine, William G.....	06 5 00		Wheatcroft, John C.....	06-07 10 00	
Van Antwerp, James C.....	06-07 10 00		Wheeler, A. Alton.....	06 5 00	
Van Derveer, Robert H.....	06-07 10 00		Wheeler, Carleton B.....	07 5 00	
Van Schaak, Cornelius P.....	06-07 10 00		Wheeler, William D.....	04-05 10 00	
Van Sickle, George C.....	06 5 00		White, Charles H.....	05-06 10 00	
Vanderklee, Charles E.....	06 5 00		White, Robert C.....	06-07 10 00	
Vargas, Jorge.....	07 5 00		White, William R.....	05-06 10 00	
Varney, Edward F.....	05-06 10 00		Whitehead, Eugene T.....	05-06 10 00	
Vause, H. Russell.....	06 5 00		Whitney, David V.....	06 5 00	
Veaco, Sidney H.....	06 5 00		Wiegel, Carl G.....	07 5 00	
Voegel, Thomas.....	06-07 10 00		Wilbur, Lot.....	07 5 00	
Voigt, Joseph F.....	07 5 00		Wilcox, Levi.....	07 5 00	
Von Stein, John H.....	06 5 00		Wiley, Harvey W.....	06 5 00	
Voorhees, Harry B.....	06 5 00		Willard, Rowland.....	07 5 00	
Voss, Edward, Jr.....	07 5 00		Willenbrink, Charles A.....	06 5 00	
Voss, George W.....	07 5 00		Williams, Edward.....	06 5 00	
Votteler, William.....	06-07 10 00		Williams, George G.....	06 5 00	
Vowell, Louis S.....	07 5 00		Williams, John K.....	05 5 00	
Waddell, Minor T.....	06 5 00		Williams, R. Wellington.....	06-07 10 00	
Walbridge, Cyrus P.....	07 5 00		Williams, Seward W.....	06 5 00	
Waldner, Paul J.....	04 5 00		Williams, Walter G.....	06 5 00	
Walker, Alfred.....	06 5 00		Willman, William G.....	07 5 00	
Walker, Charles H.....	06-07 10 00		Wilson, George A.....	06 5 00	
Walker, William A.....	06 5 00		Wilsen, Joseph M. S.....	06 5 00	
Wall, Otto A.....	04-05 10 00		Wilson, Charles F.....	06 5 00	
Wallace, John C.....	06 5 00		Wilson, Frederick H.....	06-07 10 00	
Walsdorf, Charles A.....	05-06 10 00		Winberg, Washington W.....	06-07 10 00	
Walsdorf, Edward H.....	06-07 10 00		Wirth, Adam.....	06-07 10 00	
Walter, Charles A.....	06-07 10 00		Wirthman, J. George.....	06 5 00	
Walter, Peter G.....	06 5 00		Witting, Frederick F.....	06 5 00	
Walton, Lucius L.....	06 5 00		Wolcott, Frank E.....	06 5 00	
Walz, J. Lee.....	06-07 10 00		Wolf, Charles A.....	06-07 10 00	
Wangler, Conrad D.....	06-07 10 00		Wolf, J. Carleton.....	07 5 00	
Wanous, Josie A. (Miss).....	05-06 10 00		Wolf, Michael F.....	06-07 10 00	
Ward, A. Jae.....	06 5 00		Wolff, Edward H.....	07 5 00	
Ware, Charles H.....	06 5 00		Wood, Alonzo F., Jr.....	07 5 00	
Warfield, James A.....	06-07 10 00		Wood, Horatio C., Jr.....	06 5 00	
Warr, William E.....	07 5 00		Wood, James P.....	07 5 00	
Warner, William R., Jr.....	06-07 10 00		Wood, John W.....	06 5 00	
Watson, Herbert K.....	06 5 00		Woodman, Walter I.....	07 5 00	
Watson, Joseph R.....	06 5 00		Woodward, Albert A.....	06 5 00	
Wenber, John A.....	06 5 00		Woodworth, Benjamin S.....	06 5 00	
Webber, Arthur H.....	06-07 10 00		Woodworth, Charles B.....	06 5 00	
Webber, J. Le Roy.....	07 5 00		Woolsey, Jesse F.....	04-05 10 00	
Weber, Eugene.....	06 5 00		Wright, Charles L.....	06 5 00	
Weed, Nelson.....	07 5 00		Wuensh, Charles.....	06 5 00	
Weidemann, George B.....	06 5 00		Wulling, Frederick J.....	07 5 00	
Weil, Albert J.....	06 5 00		Wunderlich, Edward.....	06 5 00	
Weilbaecher, Frank E.....	05-06 10 00		Wurm, Theodore H.....	06 5 00	
Weinstein, Abraham.....	06 5 00		Wyckoff, Elmer E.....	06 5 00	
Weinstein, Joseph.....	06 5 00		Yeomans, Sidney C.....	06 5 00	
Weiser, William A.....	06 5 00		Young, Harry G.....	06 5 00	
Weiser, William P.....	07 5 00	5 00	Zamentowsky, David.....	06 5 00	
Weiss, Conrad H.....	05-06 10 00		Zeamer, Henry W.....	06-07 10 00	
Weller, Frank P.....	06 5 00		Zelinski, Walter F. von.....	06 5 00	
Wendel, H. Edward.....	06 5 00		Ziegler, Howard P.....	05-06 10 00	
Werckshagen, Otto.....	07 5 00		Zottman, William H.....	07 5 00	
Werner, Rudolph C.....	06 5 00		Zuber, A. E.....	06 5 00	
Weiner, Henry C.....	06 5 00		Zjenkeler, J. Ferd.....	07 5 00	
West, Charles H.....	07 5 00		Zurawski, Narcys J.....	06 5 00	
West, Fred.....	06 5 00				
Amount carried forward.....	\$7775 00	\$150 00	Totals.....	\$8170 00	\$150 00

OBITUARY NOTICES.

Name.	Address.	Elected.	Died.	Born.	Preceptor.	College.
Canning, Henry.....	Dorchester, Mass.....	1865.....	July 12, 1907.....	June 3, 1842.....	Theodore Metcalf.	
Hiriart, Sebastian.....	Plaquemine, La.....	1891.....	March 17, 1906.....	March 3, 1848.....		Univ. of La., Med. Dept.
Kent, Robert Restieaux ²	New York City.....	1855.....	May 10, 1907.....	1824.....		
Milligan, Decatur.....	Philadelphia, Pa.....	1867.....	April 24, 1907.....	January 2, 1834.....	Dr. Schaeffle.....	Philadelphia C. of Ph.
Ollif, James Henry.....	Plainfield, N. J.	1867.....	January 17, 1907.....	1820.....		New York C. of Ph.
Peck, George Lyman.....	Jamaica, N. Y.....	1883.....	February 3, 1907.....	September 30, 1832.....	J. S. Seabury.	
Patten, Ichabod Bartlett.....	Boston, Mass.....	1858.....	July 17, 1906.....	April 28, 1826.....	William Brown.	
Watson, Sidney Powell.....	Atlanta, Ga.....	1887.....	November 28, 1906.....			
Wetterstroem, Albert Fred.....	Cincinnati, O.....	1888.....	July 15, 1907.....	November 10, 1854.....	Robert Kuertze.....	Cincinnati C. of Ph.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians, and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the Council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when, upon receiving

the votes of three-fourths of the members present, it shall become a part of this Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

BY-LAWS.

CHAPTER I.

Of the Election of Officers.

ARTICLE I. A Nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

ARTICLE II. The Nominating Committee shall submit the names of three persons as candidates for each of the offices of President, First Vice-President, Second Vice-President, Third Vice-President, and three members of the Council. These names are to be submitted by the General Secretary by mail to every member of the Association, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after the adjournment of the annual meeting.

ARTICLE III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the *Bulletin* of the Association.

ARTICLE IV. The officers thus elected by a majority vote of the members of the Association shall be installed at the final general session of the next annual meeting.

ARTICLE V. The Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary shall be elected annually by the Council.

CHAPTER II.

Of the President and Vice-Presidents.

ARTICLE I. The President shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, not provided for in the By-Laws or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER III.

Of the General Secretary.

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary not to exceed \$1000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general sessions, and carefully preserve, on file, all reports, essays, and papers of every description presented to the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Report of the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act. He shall notify every member at least two weeks in advance of the time and place of each annual meeting.

CHAPTER IV.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists, may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

CHAPTER V.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed \$750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of \$5,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or a Trust Company acceptable to the Council.

CHAPTER VI.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed \$750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such statistical and biographical notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting, unless such meeting is held previous to August 1. An introduction or synopsis of the Report is to be presented to the Section on Scientific Papers.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VII.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by vote of the Council, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of ex-officio members; one member from each local branch of this Association and nine other members, selected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years. None but *ex-officio* members of the Council shall be eligible for re-election thereto until one year after the expiration of their term of office.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, the Chairmen of the Sections of the Association, and the Secretary of the Council, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section 1.* The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears, one copy of the annual Report of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sessions of the Association and of the Sections, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as it may deem worthy of insertion. It shall also fix the price at which the Proceedings may be sold.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany, who may be especially interested in Pharmacy and Materia Medica, also editors and publishers of pharmaceutical journals, who, after duly considering the objects of the Association and the obligations of the Constitution and By-laws, subscribe to them, are eligible to membership; provided that any person whose name has been dropped from the roll of members for non-payment of dues may be readmitted after having again made application in regular form, the application being accompanied by the usual fee; or he may be readmitted, without such application, on payment of all back dues; in the latter case his membership shall date from the time when he first joined the Association, as previously printed in the Roll of Members, and notice of such action shall be inserted in the addendum to the Treasurer's report.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of three-fourths of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By Laws and paying the annual dues for the current year. Any newly-elected member, upon the payment of the annual dues for the year in which he is elected, shall be entitled to the annual volume of the Proceedings and all publications of the Association that are distributed to its members during the year. Any applications for membership made during the fiscal year viz., between July 1 of one year and July 1 of the following year shall be considered as of the current fiscal year; except that persons applying on or after March 1st shall not be *required* to pay the annual dues for that year, but if they do pay such dues they shall receive all the publications to which members are entitled for the year.

ARTICLE III. Every member shall pay in advance to the Treasurer the sum of *Five Dollars* as his yearly contribution, and by neglecting to pay said contribution for *two successive years* he may be dropped from the Roll.

ARTICLE IV. Any member of the Association who shall pay to the Treasurer the sum of \$100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of \$75.00, or after fifteen years the sum of \$50.00, or after twenty years the sum of \$25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the annual meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received

as a delegate. All credentials shall be sent to the General Secretary *at least two weeks* in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Three Dollars* or of *Five Dollars*, to receive from the Treasurer respectively a *paper* or *parchment* certificate of membership signed by the President, one Vice-President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER IX.

Of Meetings and Sessions.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, five Sections shall be formed, as follows: 1. Section on Scientific Papers; 2. Section on Commercial Interests; 3. Section on Practical Pharmacy and Dispensing; 4. Section on Pharmaceutical Legislation and Education; 5. Section on Historical Pharmacy.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of Council, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. At the third session the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. At the fourth and fifth sessions the Section on Pharmaceutical Legislation and Education shall consider the business assigned to that Section.

ARTICLE VII. The sixth and seventh sessions shall be devoted to the reading of Scientific Papers and the discussions thereof.

ARTICLE VIII. The eighth and ninth sessions shall be devoted to the subject of Practical Pharmacy and Dispensing.

ARTICLE IX. The tenth session shall be devoted to the subject of Historical Pharmacy.

ARTICLE X. A Chairman and a Secretary shall be elected by ballot by each Section to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE XI. The Chairman of each Section shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the annual meeting.

ARTICLE XII. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging in advance the business to come before the Section at the next annual meeting; these committees in each case becoming Standing Committees of the Association.

ARTICLE XIII. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by their titles, synopsis or in full, and laid on the table for future consideration.

Section 6. The President shall call the roll of States, the Territories, District of Columbia and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association, and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association at large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

Section 7. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, its acts shall be revised, so as to be acceptable to the Association.

Section 8. Incidental business.

ARTICLE XIV. The order of business at the second general session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The Report of the Committee on Nominations shall be read.

Section 4. Reading of the Minutes of the Council.

Section 5. Reading of the Reports of the Treasurer and General Secretary.

Section 6. Reports of Standing Committees shall be read.

Section 7. Reports of Special Committees shall be read.

Section 8. Incidental business.

Section 9. Adjournment subject to the call of the President.

ARTICLE XV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XVI. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XVII. At the last general session of the Association the newly-elected officers of the Association shall take their respective places.

ARTICLE XVIII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER X.

Of Committees.

ARTICLE I. There shall be appointed or elected ten Standing Committees as follows: a Committee on the U. S. Pharmacopœia and a Committee on Transportation, each to consist of ten members; a Committee on Time and Place of Meeting, a Committee on Commercial Interests and a Committee on Pharmaceutical Education and Legislation, each to consist of five members; a Committee on Scientific Papers, a Committee on Practical Pharmacy and Dispensing, a Committee on Historical Pharmacy, a Committee on Ebert Prize, and a Committee on General Prizes, each to consist of three members.

ARTICLE II. The Committee on Commercial Interests shall be elected by the Section on Commercial Interests. It shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. It shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be elected by the Section on Scientific Papers. It shall arrange the business of the Section, and shall report a number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person desiring to submit a paper to the Association shall present to the Chairman of the particular Section to which it refers, at least ten days prior to the meeting, an abstract of said paper, indicative of its contents, and consisting of not less than fifty nor more than two hundred words.

This abstract shall be printed as a part of the programme. The paper itself must be submitted to the officers of the Section previous to the first session. Not more than ten minutes shall be allowed for the presentation of any paper, unless by unanimous consent of the Section.

ARTICLE V. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, at the next annual meeting after the one at which essays are presented, determine which, if any of them, has met the re-

quirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE VI. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE VII. The Committee on Practical Pharmacy and Dispensing, composed of members actually engaged in the retail drug business, shall be elected by the Section on Practical Pharmacy and Dispensing. It shall arrange in advance the business to come before the Section at the next annual meeting. It shall propose a series of subjects for general discussion, and solicit papers on subjects pertaining to the actual practice of pharmacy in retail stores.

ARTICLE VIII. The Committee on Pharmaceutical Legislation and Education, which shall be elected by the Section on Pharmaceutical Legislation and Education, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. It shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year. It shall arrange the business of the Section in advance of its sessions, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to it by the Section. It shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE IX. The Committee on Historical Pharmacy shall be elected by the Section on Historical Pharmacy. It shall arrange the business of the Section and shall present annually matters of special historical interest in pharmacy. It shall also secure the collection of letters, papers, etc., written by members of the Association, which when so collected shall remain in the custody of the committee and be available for reference to any one interested.

ARTICLE X. The Committee on the United States Pharmacopœia shall be appointed by the President of the Association, as follows: One member to be appointed for ten years and one for nine, eight, seven, six, five, four, three, two and one years respectively, each vacancy occurring by expiration of term to be filled by a new appointment for ten years. The Committee shall elect its own Chairman annually. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It shall also note errors of any kind found in the U. S. Pharmacopœia, so as to facilitate and aid the work of the National Committee on Revision of the U. S. P.

ARTICLE XI. The Committee on Transportation, which shall be elected by the Council shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

CHAPTER XI.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

ARTICLE V. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

CHAPTER XII.

Local Branches.

ARTICLE I. Local branches of this Association may be formed wherever it may appear that twenty-five members of this Association, in good standing, will participate, provided that no more than one such branch shall be formed in any one State, province, district or territory, unless the additional branches shall be formed at a point distant one hundred miles or more from any branch already established in the same State, province, district or territory.

ARTICLE II. All active or voting members of local branches must be members of this Association in good standing.

ARTICLE III. The objects and aims of local branches of this Association shall be the same as set forth in Article I of the Constitution of this body, and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it. And no local branch shall enact any article of Constitution or By-Law in conflict with the Constitution or By-Laws of this Association.

ARTICLE IV. Each local branch having twenty-five active or voting members shall be entitled to elect one member every three years, who shall become and continue a member of the Council of this Association for that time.

CHAPTER XIII.

Miscellaneous.

ARTICLE I. Every proposition to alter or amend these By-Laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary not to exceed \$300.

ARTICLE II. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

ARTICLE III. The Secretary of the Council shall also officiate as Secretary of the Committee on Membership.

CHAPTER IV.

Of Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of seven members of the Council, to be elected annually by ballot. The General Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect its chairman immediately after the election of its members by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present to the Council the list of applicants for membership who have complied with the requirements of the By-Laws of the Association.

ARTICLE III. It shall furnish appropriate biographical sketches of deceased members for publication in the Report of the Proceedings.

CHAPTER V.

Of Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council. Immediately after its election by the Council, the Committee shall elect a Chairman.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Report of the Proceedings.

CHAPTER VI.

Of Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members, who shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

Of Sessions.

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Nine members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman, and the Secretary.
2. Election of the Standing Committees of Council, as follows:
 - a. Committee on Membership, consisting of seven members of the Council, the General Secretary and the Treasurer.
 - b. Committee on Finance, three members.
 - c. Committee on Publication, five members.
 - d. Committee on Centennial Fund, three members.
3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

GENERAL RULES OF FINANCE.

ADOPTED 1883, AMENDED 1885, 1887, 1888, 1895, 1900, 1901, 1903.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth, The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

Sixth, There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town, the Chairman to be a member of the Finance Committee.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Auditing Committee, at such time and place in July of each year as said Chairman may direct.

The Chairman of the Council, in the presence of another member of the Association, shall make a list of the numbers and amounts of the bonds belonging to the Association, and both shall make affidavit to such list, which shall then be forwarded to the Auditing Committee for their use in auditing the books of the officers of the Association.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, saving-bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Tenth, There shall be a meeting of the Auditing Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

Eleventh, The expense of the bond of the Treasurer, given by a Trust Company, shall be paid for from the Treasury.

Twelfth, The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

Thirteenth, The Finance Committee shall each year, previous to June 1st, present to the Council for its consideration a list of appropriations to cover the various expenditures of the coming fiscal year, the total of such appropriations to be based on the probable amount to be received from the annual dues for the coming year. No payment shall be made in excess of said appropriation except by special vote of the Council. *Provided*, however, that the Treasurer shall be authorized to transfer from one account to another, such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty (50) dollars.

Fourteenth, All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

ENGLAND.

Dr. John Attfield, F. R. S., *Watford*, 1871. Michael Carteighe, F. I. C., *London*, 1882.
E. M. Holmes, F. L. S., *London*, 1899.

GERMANY.

Dr. Edward Schaer, *Strassburg*, 1877. Dr. Ernst Schmidt, Geb. Reg. Rath,
Marburg, 1899.

INDIA.

David Hooper, F. I. C., F. C. S., *Calcutta*, 1899.

RUSSIA.

Johannes von Martenson, Staatsrath, *St. Petersburg*, 1882.
(985)

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.

(The names of Life Members in SMALL CAPITALS. Names of Life Members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA.

ALABAMA.	ARKANSAS.
<i>Anniston.</i>	<i>Camden.</i>
Wikle, Jesse Lane .....1898	Morgan, Aylmer Lee.....1890
<i>Auburn.</i>	<i>Clarksville.</i>
Dow, John Cameron.....1907	Warren, Robert Arthur. ....1907
Miller, Emerson Romeo.....1895	<i>Dermott.</i>
Perdue, William Louis .....1907	Bordeaux, Henry.....1907
<i>Fort Morgan.</i>	<i>England.</i>
Thurston, Edwin Joseph.....1904	Ayres, Gold .....1907
<i>Gadsden.</i>	<i>Fort Smith.</i>
Cross, Elias Howell.....1905	Howard, Sam. Allen. ....1907
<i>Marion Function.</i>	Sparks, James Mitchell.....1894
Harrell, Preston Brooks, Jr.....1905	<i>Hot Springs.</i>
<i>Mobile.</i>	Bancroft, Richard Bayard.....1907
CANDIDUS, PHILIP CHARLES .....1857	Beasley, Robert Sidney.....1906
Eichold, Bernard Herbert .....1905	Craft, Oliver Austin.....1907
Maguire, Edward Sylvester.....1897	Deming, William Albert .....1907
Roe, John T. ....1907	Eisele, Martin A.....1907
van Aller, Thomas S. ....1907	Ellis, William Henry.....1907
Van Antwerp, James Callanan.....1905	Hogaboom, George Adelbert....1907
<i>Montgomery.</i>	Humphreys, Charles John .....1907
Knabe, Gustavus Alexander.....1876	Hunt, Byrd Henderson.....1907
<i>Prattville.</i>	Jackson, Samuel Rudolph .....1907
Scott, Clarence Alexander .....1905	Jeffrey, Frank Dana .....1907
ARIZONA.	Jennings, Algernon Coleman.....1907
<i>Phoenix.</i>	King, Jacob Harvey Curry.....1907
Roziene, Robert Philip Mathias .....1904	Klein, Ernest Frederick .....1894
<i>Prescott.</i>	Lehman, Charles Walter.....1907
Brisley, Harry .....1894	Lemly, Charles Clifton .....1907
	Lushy, William Henry .....1907
	Meadows, Asbury Watkins.....1907
	Morris, Richard Grant ... ..1907

Schachleiter, Francis George1906
 Schneck, Charles1907
 Scholastica, Sister Mary1907
 Sears, Joseph Edward1907
 Vaughn, Patrick H.1907
 Weimar, Henry1907

Imboden.

Ketchum, James Spear1907

Little Rock.

Bond, John Barnitz1883
 Bond, William Catis1907
 Dawson, Charles Hampton1907
 Fein, Mary Augustine1907
 Ginocchio, James Alexander1906
 Hegarty, Charles Kiely1906
 Knox, Steven Douglas1907
 McClerkin, Felix William1907
 Snodgrass, Latta Kavanaugh1901
 Stahel, Albert William1907
 Wilkes, George Redford1907

Newport.

Bevens, Joe Lee1907

Piggott.

Potter, Herschel E.1907
 Potter, Maynard H.1906

Pine Bluff.

Dewoody, William Lawrence1887

Pocahontas.

Skinner, William Henry1905

Warren.

Appleton, William Riley1901

CALIFORNIA.

Angel Island.

Mason, Myron Robinson1904

Arcata, Humboldt Co.

Bohmanson, Robert Hugo1901

Auburn.

Stevens, Frederick Solon1903

Hayward.

Sporndli, Ernest1906

Livermore.

McKown, Joseph Oscar1906

Long Beach.

Smith, Harley Earl1903

Los Angeles.

Banks, Walter C.1907
 Bothwell, Samuel Fowler1907
 Dean, H. G.1907
 Diggs, Lowell C.1907
 English, William Morrison... ..1907
 Jones, Thomas William1907
 Kirkland, Derwentwater1889
 Leith, James Craig1907
 McKenna, Harry A.1907
 Newlon, Howard Marcus1907
 Owen, Frank D.1907
 Peairs, Howard A.1907
 Sale, Howard Malcomb1907
 Schroeter, Herman M.1907
 Taylor, Walter T.1907
 Trout, John Henry1907
 Wilson, George Baright1907
 Wolf, Frank Charles1907

Napa.

Levinson, Joseph1895
 Shoults, Robert Grafton1901

Oakland.

Varney, Edward Francis1892

Ontario.

Jesson, Jacob1872

Pasadena.

Smith, Lauriston Stephen1892

Sacramento.

Lichthardt, George Henry Philip1902

San Francisco.

Baer, Edward Arthur1907
 Bayly, Charles Alfred1889
 Boulton, Emison Allen1902
 Boyken, John William1902
 Boyson, John Henry1905
 Briggs, Armand Eugene1907
 d'Artenay, Eugene1907
 Dawson, John Henry1882
 Donahue, Henry M.1907
 Donohue, Henry1903
 Drossel, August Adolph1902
 Drucker, August Elisha1904
 Eschmann, Clemens L.1907
 Esters von Krakau, James Henry Wil-
 liam1897

Goodman, Laura	1907
Grazer, Frederick Augustus	1904
Guehring, John, Jr.	1907
Jorgenson, Edward B.	1902
Miller, Charles	1897
Neal, Charles W.	1907
Poehner, Adolf A.	1907
Prior, Toney	1905
Schmidt, Valentine	1887
Schneider, Albert	1899
Searby, William Martin	1882
Sharp, Sol. Albert	1902
Stange, Carl Frederick	1897
STEELE, JAMES GURDEN	1859
WENZELL, WILLIAM THEODORE	1870
Whilden, Charles Bennett	1907
Winter, James Henry	1904
Wulzen, Dietrich Henry	1907
Zabaldano, Alexander	1902

San Mateo.

Baskette, Frank E.	1907
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Vallejo.

Fletcher, David Maass	1904
Klotz, Gus. Oscar	1905
West, Fred	1906

COLORADO.

Central City.

Best, John	1886
Davies, Llewellyn Powell	1891

Colorado Springs.

Brown, John Cecil	1905
Depeyre, Louis Noel	1894
Ward, Augustus Jae.	1893

Cripple Creek.

Beitenman, William Wallace	1888
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Denver.

Anglum, John	1902
Clayton, Charles J.	1905
Ford, Charles Mangan	1887
Hover, William Adgate	1895
Walbrach, Arthur	1881

Fort Collins.

Scott, Alexander W.	1906
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Las Animas.

Hammar, Alrik	1897
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Leadville.

Kolsch, Julius	1902
Nordlander, Anders Gustavus Emilus.	1905

Longmont.

Witting, Frederick Frank.	1902
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Pueblo.

Taylor, George Edward	1895
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COLUMBIA, DISTRICT OF.

Anacostia.

Weiss, Conrad Henry	1900
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Washington.

Alexander, Charles Ellis	1899
Blackmore, Henry Spencer	1896
BOYD, GEORGE WASHINGTON.	1883
Bradbury, Wymond Henry	1895
Campbell, Charles Berger	1902
Criswell, Francis McClure	1892
Duckett, Walter G.	1876
Easterday, Herbert Clifton	1893
Elliott, Charles Houston	1899
Flemer, Louis	1895
Franzoni, Joseph Dunbar	1900
Gahn, Henry	1902
Gordon, Frederick Troup	1900
Gross, Charles Ernst	1900
Henkel, Alice	1902
Henry, Frank Clinton	1894
Herbst, William Parker	1895
Herty, Frank James	1907
Hilton, Samuel Louis	1890
Hoover, George William	1905
Howell, Percy Clifton	1906
Hunt, Reid	1904
Hurtlebaus, George William	1895
Kalusowski, Henry E.	1904
Keller, Lyman Frederic	1894
Loussararian, Armenag Hovhannes ..	1905
Luve, Frank A. A.	1902
Major, John Richards	1873
McKay, Malcolm	1905
Milligan, John Dean	1900
Motter, Murray Galt	1904
Neeley, Guy Minick	1900
Quigley, Richard Lucien	1902
Rabak, Frank	1905
Richardson, Willard Stowell	1900
Ryder, Louis Wadsworth	1907
Schulz, Henry Louis	1905

Seidell, Atherton	1907
Sievers, Arthur	1906
SIMMS, GILES GREEN CRAYCROFT	1860
Stevens, Edward	1903
Stott, Samuel Thompson	1900
Taylor, Augustus Carrier	1900
Troxler, Robert Fulton	1902
True, Rodney Howard	1904
Weller, Franklin Pierce	1900
Wiley, Harvey Washington	1902

CONNECTICUT.

Bethel.

Garvin, Patrick Joseph	1905
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Bridgeport.

Hamilton, William Clinton	1902
Hartigan, Joseph Dennis	1902
Jamieson, George Alexander	1903
Leverty, John Augustine	1900

Danbury.

Dickinson, Arthur Lyman	1900
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Danielson.

Morin, Ludger Joseph	1905
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Hartford.

Duggan, James	1894
Rapelye, Charles Andrew	1876
Rapport, George L.	1907
Roemer, Frederick	1905
Seinsoth, John Jacob	1900
Stoughton, Dwight George	1890
Williams, John Kirby	1875

Meriden.

Mosher, William Wooster	1894
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Middletown.

Hartman, Frank Clayton	1905
Pitt, John Richard	1872

New Haven.

Fleischner, Charles	1905
Gessner, Emil Adolph	1878
Hodgson, Joseph Arthur	1903
Hogan, John Joseph	1890
Mix, Willis Lee	1896
Spalding, Warren Alphonso	1876
Wood, Alonzo Felton, Jr.	1890
Wood, James Prior	1890

New London.

Daboll, Horace Hart	1903
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Putnam.

Dresser, George Edward	1886
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Stamford.

Finch, Charles Smith	1900
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Waterbury.

Ebbs, John Buddington	1905
Newton, Clarke Henry William	1905
Wilcox, Levi	1903
Woodruff, Roderick Samuel	1876

Winsted.

Judson, Arthur F.	1907
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DELAWARE.

Wilmington.

Watson, Herbert Kennedy	1888
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FLORIDA.

De Land.

Fisher, George Washington	1893
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Eureka.

Parramore, George Brinson	1904
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Inverness.

Lloyd, Strauss Leonidas	1906
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Jacksonville.

Dixon, John Marion	1894
Jones, William Daniel	1903
Kirk, James Edgar	1903
Stewart, Harry Erson	1903

Key West.

Paine, E. Fernandez	1906
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Miami.

Abernethy, John Cocke	1904
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Monticello.

Palmer, John Dabney	1902
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Ocala.

Groves, Henry Conrad	1903
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Palatka.

Ramsaur, David Wilfong	1902
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Pensacola.

Pettersen, Ernst Wilhelm	1905
Stearns, William Lincoln	1903

Sarasota.

Brown, John Oliver 1905

Satsuma Heights.

Richtmann, William Oscar 1904

St. Augustine.

Speer, Charles Claude 1902

Woodman, Walter Irving 1893

Tampa.

Berger, Ernest 1902

Hutchinson, Currie J. 1905

Itizarri, Miguel Pino 1903

Russell, Hamilton 1905

GEORGIA.

Atlanta.

Elkin, William Simpson 1905

Kelley, Ruben Benjamin 1905

Payne, George Frederick 1893

Pitts, William Burton 1903

Augusta.

Durban, Sebastian Charles 1883

LAND, ROBERT HENRY 1859

Land, Robert Henry, Jr. 1902

Printup, Daniel 1903

Brunswick.

Smith, John Stovall 1930

Fitzgerald.

Goodman, John Hawkins 1904

Fort Oglethorpe.

Galvin, Mathew 1906

Greenville.

Culpepper, Thomas Jefferson 1903

La Grange.

Davidson, Edgar Cyrus 1902

Macon.

Cheatham, Thomas Alexander 1890

Morris, Max 1898

Rome.

Curry, David W. 1894

Savannah.

La Grange, John V. 1905

Oliveros, Sidney Alphonse 1907

Rowlinski, Robert Antone 1892

Solomons, Isaiah Abram 1894

Spangler, Lewis Clayton 1902

Thomasville.

Thomas, Robert, Jr. 1888

HAWAIIAN ISLANDS.

Honolulu.

Beck, Julius Edward 1904

Gibson, Frank Leighton 1904

Pfluger, Henry Christian 1903

RUMSEY, SAMUEL LOUIS 1876

IDAHO.

Boise.

St. John, Sidney Sylvester 1897

Emmett.

Smithson, David Elmer 1890

Pocatello.

Rice, Ivan Snyder 1906

ILLINOIS.

Aurora.

Kempf, Frederick F. 1907

Staudt, Louis Carl 1890

Bloomington.

Garver, Christian 1905

Blue Island.

McPherson, George 1865

Cairo.

Metzger, Matthias Clyde 1902

Schuh, Paul Gustav 1894

Camp Point, Adams Co.

Bartells, George Case 1881

Carbondale.

Patten, Eustis 1900

Carlinville, Macoupin Co.

Loehr, Theodore Christian 1888

Steinmeyer, William Otto 1901

Chicago.

Adamick, Gustave Hattenhauer 1891

Ade, Daniel Andrew 1906

Ahlborn, Frank Henry 1906

Anderson, Carl Godfrey 1907

Avery, Charles Hamilton 1905

Bachelle, Percy von 1905

Bachelle, Rudolph von 1906

Baguley, Clarence B. 1905

Barnes, Walter E.	1906	Harrison, William Henry	1905
Bartlett, James E.	1906	Hartwig, Otto Julius	1892
<i>Bartlett, Nicholas, Gray</i>	1861	Hauber, Peter Paul	1906
Bate, Henry John	1906	Heiss, Ernest J.	1907
Baur, Jacob	1879	Hellmuth, Joseph Anthony	1905
Becker, Irwin Atwood	1905	Hermanek, Joseph Charles	1904
Behrens, Emil Christian Louis	1893	Hiss, Andrew Emil	1906
BIROTH, HENRY	1865	Hudson, Daniel F.	1907
Blahnik, Karel Bartholomae	1907	Hoelzer, Bruno Alfred Christian	1905
Blahnik, Marie (Mrs.)	1905	Hull, Ralph Wilbur	1906
Blahnik, Vencel Lorenz	1907	JAMIESON, THOMAS NEVIN	1903
Bodemann, Wilhelm	1906	Jehlik, Anton Josef	1906
Boehm, John J.	1905	Jensen, Gerhard H.	1906
Brenner, George Frederick	1906	Johnstone, J. C.	1907
Bruder, Otto Emil	1905	Josenhans, Reinhardt Carl Johannes ..	1907
Brunn, Harold Nicolai	1905	Jungk, Walter August	1907
Byrud, John	1905	Kahn, Julius H.	1905
Cassin, Elmer Eldorado	1907	Karg, George	1907
Chantler, Vincent Huron	1906	Kasper, Albert Franklin	1906
Christensen, Henry C.	1906	Keeling, Francis, Jr.	1905
Clark, Albert Henry	1905	Klenze, William Theodore	1905
Collins, John Stephen	1906	Koch, Fred Conrad	1907
Cooban, Benjamin Slater	1902	Kolar, Gustav Stanley	1905
Crawshaw, Harwood Herbert	1907	Krizan, William	1906
Danden, Raymond August von	1906	Ladish, Erich Herman	1905
Day, William Baker	1895	Lake, Claude C.	1905
Dieden, Frank Xavier	1905	Lambert, Richard Jay	1906
Donaberger, Samuel Bricker	1906	Lehman, Louis	1905
Elsner, Fred. Hamroad.	1906	Letzler, Axel Emil	1906
Engelhard, George Pierre	1903	Lewis, I. Giles	1905
Eysenbach, Henry Philip	1905	Light, Isam M.	1907
Finnenger, Paul Ernest	1906	<i>Lora, Thomas</i>	1882
Fischnar, John Ferdinand	1905	Lorenz, John Stanley	1906
Fisk, Frank Elmer	1902	Machenheimer, Don Grover	1906
Forsyth, William Kitchin	1902	Mares, Frank Martin	1902
Friesenecker, Charles M.	1907	Martin, Frank William	1906
Fry, Herman	1902	Martin, John Fraley	1905
Fry, Narcys George	1906	Matthison, Soren	1905
FULLER, OLIVER FRANKLIN	1869	Matthews, Charles Edwards	1893
Gale, Abram	1905	McClugage, John Jordan	1905
<i>Gale, Edwin Oscar</i>	1857	McClure, Ulysses Gilmore	1906
<i>Gale, William Henry</i>	1857	McConnell, Charles Henry	1899
Gordin, Henry Mann	1899	McQuillen, Francis	1906
Grassly, Charles William	1884	McVay, Ernest Avery	1906
Gray, Margaret McClintock (Mrs.) ..	1901	Meixner, Fred. Morris Frankford	1906
Gray, William	1892	Meyer, Frederick Hugo	1907
Green, Carl Victor	1906	Miller, Albert	1907
Haeger, Fred	1906	Miner, Maurice Ashbel	1880
Haeseler, Frank Preston	1906	Mrazek, Leo Ludwig	1906
Haeseler, Loren Milton	1906	Murbach, John E.	1905
Hallberg, Carl Swante Nicanor	1879	Niethammer, Otto F.	1905
Hanson, George Conrad	1905	Nitardy, Ferdinand	1905

Oglesby, George Daniel	1905	Zamentowsky, David	1906
Oldberg, Oscar	1873	Zelinski, Walter, Franz von	1905
Ortenstein, Harry M.	1906	Zuber, A. E.	1906
Patterson, Charles Waggener	1905	Zurawski, Narcys J.	1906
<i>Patterson, Theodore Henry</i>	1869	<i>East St. Louis.</i>	
Pfaff, Henry, Jr.	1907	Knoebel, Percy Thomas	1907
Pierce, Olive Blake	1906	Knoebel, Thomas	1892
Porter, George Melville	1906	<i>Evanston.</i>	
Puckner, William August	1888	Gsell, Earl Wilson	1905
Quales, Iver Lawson	1905	<i>Fairmount.</i>	
Rhode, Rudolph Ernst	1887	Tilton, Claude Enoch	1905
Riemenschneider, Julius Henry	1906	<i>Freeport.</i>	
Rommel, Hans Carl	1907	McNeas, Frederick William	1906
Rosenthal, Joseph	1906	<i>Geneseo.</i>	
Rounds, Marvin Bird Cleo	1905	Stamm, Dante Milton	1896
Rowles, Walter David	1905	<i>Girard, Macoupin Co.</i>	
Rozanski, Boleslaus J.	1906	Deck, Lewis Cass	1901
Runkel, Julia	1905	<i>Grayville.</i>	
Salchert, Herman Anton	1906	Wheatcroft, John Christopher	1906
Sass, Stephen Konrad	1905	<i>Greenup.</i>	
Sawyer, Hilon Hill	1906	Conzet, Rufus Warren	1904
Schaper, Henry Frederick	1905	<i>Joliet.</i>	
Scheips, Theodor Immanuel	1905	Fahrner, Alphonse Anthony	1906
Scherer, Andrew	1884	<i>Kankakee.</i>	
Schmidt, Florian Charles	1882	Schubert, John Joseph	1907
Schmidt, Florian Joseph	1906	<i>Liberty.</i>	
Schmidt, Frederick Michael	1887	Mercer, William Elmer	1902
Schneider, Carl Henry	1906	<i>Moline.</i>	
Schreiner, Louis I.	1905	Lindvall, Charles Gustaf	1897
Schweitzer, Joseph	1906	Sohrbeck, George Henry	1888
Scofield, J. Walker	1905	Sohrbeck, George William	1897
Shurtleff, Wilford C.	1906	<i>Mount Vernon.</i>	
Smith, Ralph N.	1906	Bond, Jackson Newlon ..	1902
Snow, Clyde Mason	1903	Morse, Edward Worth	1896
Snow, Herbert Waldemar	1906	<i>Oak Park.</i>	
Stahl, Amanda Wilhelmina	1903	McCauley, Charles Edward	1903
Stolz, Otto G.	1905	Spater, William Charles	1905
Storer, Charles Adelbert	1906	<i>Pekin.</i>	
Stuchlik, John	1906	Ehrlicher, Henry Michael	1892
Truax, Charles	1882	<i>Peoria.</i>	
Valentine, William George	1905	Benton, Wilber Merritt	1888
Van Schaack, Cornelius Peter	1905	Lueder, Fritz	1894
Vause, H. Russell	1906		
VOISS, ARCADIUS	1901		
Walter, Charles Albert	1899		
Weydell, K. Albus	1906		
WHITFIELD, THOMAS	1865		
Winberg, Washington William	1906		
Wisdom, Hugh	1901		
WOLTERS DORF, LOUIS	1865		
Wooten, Thomas Victor	1893		
Yeomans, Sidney C.	1906		

Pesotum.

Hoffman, George Frederick1902

Polo.

Clothier, Charles Roland.....1905

Princeton.

Case, George Edwin1906

Quincy.

Heidbreder, Albert Henry.....1905

Springfield.

Dodda, Richard Newton.....1902

Stronghurst, Henderson Co.

Harter, Isaac Foster1893

Tiskitwa.

Stimson, Charlotte Elizabeth1905

Tuscola.

Stacy, Marion Franklin.....1903

Watska.

Arnold, Ethelyn Bell1905

Wilmette.

Gathercoal, Edmund Norris1905

INDIANA.

Albion, Noble Co.

Miller, Chas. Elliott.....1899

Angola.

Ritter, Clyde.....1905

Sherrard, Charles Cornell.....1893

Batesville.

Baas, George Adam.....1906

Bluffton.

Stout, Marion Alphon.....1906

Columbus.

Otto, Theodor Gotthelf Eduard.....1900

Stahlhuth, Ernest Henry William....1887

Corydon.

Riely, Louis Stoy.....1904

East Chicago.

Veaco, Sidney Harold.....1906

Evansville.

Bohn, George W.....1907

Pelz, Charles Theodore.....1907

Petersheim, John Frederick1907

Tepe, Louis1907

Fort Wayne.

Emanuel, Julia Esther.....1906

Gross, William Otto ..1901

Mertz, Edward Leander1904

Woodworth, Benjamin Studley1906

Woodworth, Charles Beecher1900

Indianapolis.

Carter, Frank Henry.....1891

Coons, William I1906

Eberhardt, Ernest Godlove1906

Eichrodt, Mary Elizabeth.....1906

Eldred, Frank Randall1905

Ferber, Edward1906

Francis, J. Richard1906

Frauer, Herman Emanuel1881

Gertler, John Henry.....1905

Huder, Henry J.....1894

Hurty, John Newell.....1882

Kassulke, August.....1905

Keemer, Edgar Brooks1907

Lilly, Eli1906

Lilly, Josiah Kirby.....1890

Lynn, Charles Jackson1906

Mueller, J. George.....1906

Schwartz, Maurice Paul.....1906

Scopp, Otto1906

Stewart, Ernest Eugene1906

Thorburn, Albert David1902

Timberlake, Arthur1902

Waddell, Minor T.....1899

Walker, William Arthur1905

Walkins, Charles Williams.....1907

Lafayette.

Green, Arthur Lawrence.....1906

Schultz, John Jacob1904

Sturmer, Julius William.....1901

La Porte.

Meissner, Frederick William, Jr.....1890

Logansport.

Hoffmann, George L.1906

Hoffmann, George William1904

Porter, William Hamlin1906

Mishawaka.

Graham, Abner B.....1907

Mt. Vernon.

Fogas, William Henry1907

<i>New Albany.</i>		<i>Callender.</i>	
Knoefel, Bruno.....	1896	Larson, Martin.....	1906
Knoefel, Charles Deitrick.....	1894	<i>Charles City.</i>	
<i>New Carlisle.</i>		Legel, John Gotthelf.....	1897
Warner, Francis Delop.....	1904	<i>Cherokee.</i>	
<i>Notre Dame.</i>		Mikkelsen, Niels.....	1903
Cajulis y Samedra, Felix.....	1907	<i>Clear Lake.</i>	
Green, Robert Lee.....	1906	Etzel, John Leonhardt	1897
<i>Rushville.</i>		<i>Davenport.</i>	
Wilson, Charles Frazee.....	1906	BALLARD, JOHN WINTHROP.....	1871
<i>Salem.</i>		<i>Des Moines.</i>	
Rudder, William Hiram.....	1907	Berner, Carl Albert	1903
<i>Sheridan.</i>		Howard, Fletcher (Mrs.).....	1905
Elliott, Cassius Eugene.....	1904	Macy, Sherman Riley	1891
<i>South Bend.</i>		Sandholm, John Alfred	1904
Bastian, Otto Carl	1903	<i>Dubuque.</i>	
Cocnley, Charles	1902	Torbert, Willard Horatio.....	1887
Eliel, Leo	1883	Witmer, Joseph Washington	1896
Meyer, Martin Monroe	1897	<i>Fort Dodge.</i>	
Weiser, William Augustus	1904	OLESON, OLAF MARTIN	1877
<i>Tell City.</i>		<i>Fort Madison.</i>	
Schreiber, Charles Christian Frederic		SCHAFER, GEORGE HENRY	1871
August.....	1901	<i>Harlan.</i>	
<i>Terre Haute.</i>		Pederson, George M.....	1905
Bretsch, John Louis.....	1906	<i>Homestead.</i>	
Buntin, William Campbell	1906	Miller, Frederick William	1902
<i>Troy.</i>		<i>Iowa City.</i>	
Gaesser, Theobald Theodore	1901	Boerner, Emil Louis	1877
<i>Valparaiso.</i>		Teeters, Wilber John	1902
Heineman, Albert F.....	1905	<i>Keokuk.</i>	
Roe, Joseph Newton.....	1902	Kiedaisch, George Arthur	1904
Timmons, George Demming	1905	<i>Leon.</i>	
<i>Warren.</i>		Ware, Clarence Walter	1907
Hickerson, William Henry.....	1894	<i>Marshalltown.</i>	
<i>Winchester.</i>		Mayer, Peter	1906
Sala, Albert Franklin.....	1905	<i>Muscatine.</i>	
<i>IOWA.</i>		Halstead, Alice Louisa (Mrs.)	1892
<i>Amana.</i>		<i>New Hampton.</i>	
Koch, August Frank.....	1903	Sayers, Milton Cary.....	1906
Schadt, Conrad	1903		
<i>Boone.</i>			
Ridgway, Lemuel Augustus	1882		

Sioux City.

Andreen, Carl 1902
 Koelle, Otto Charles 1902
 Moore, Silas Harwood 1880
 SCHERLING, GUSTAV 1884
 Thelander, Creston Carlos 1902
 Thompson, Edwin Thomas 1902

Stuart.

Treat, Joseph Augustus 1885

Unionville.

Allen, Earl 1905

Waterloo.

Wangler, Conrad David 1876

Winfield, Henry Co.

Lindly, John Milton 1901

KANSAS.

Atchison.

Cochrane, William Winston 1904
 Myers, Carvosso Oursler 1904
 Noll, Mathias 1901

Council Grove.

Gregory, Charles Alfred 1904

Ellsworth.

Sheriff, William Ebenezer 1904

Gypsum City, Saline Co.

Schmitter, Jonathan 1892

Iola.

Evans, William Jesse 1904

Kansas City.

Ackenhausen, William Andrew 1904

Lansing.

Shudrowitz, Frank Stanislas 1904

Lawrence.

LEIS, GEORGE 1869
 Moore, John Thomas 1888
 Sayre, Lucius Elmer 1883

Leavenworth.

Mehl, Henry William 1905

Onaga.

Kester, Joseph A 1904

Ottawa.

Becker, Charles Lewis 1892

Overbrook.

Topping, Arthur Ellsworth 1904

Paola.

Oyster, John Houck 1904

Topeka.

Holliday, Francis Emlen 1900

Snow, Frederick Asbury 1904

Wichita.

Henrion, Walter S. 1904

Wilmore.

Sombart, John Edward 1881

Winfield.

Friedenburg, Maximilian Wilmer 1904

KENTUCKY.

Ashland.

Lordier, Charles Joseph 1907

Bowling Green.

Wilson, George Thomas 1907

Covington.

Pieck, Edward Ludwig 1887

Willenbrink, Charles Anthony 1904

Zwick, Karl George 1899

Cynthiana.

Berry, Robert Henry 1903

Frankfort.

Gayle, John William 1891

Georgetown.

Caseldine, Harry Crabb 1907

Hawesville.

Patterson, George Orville 1907

Henderson.

Baldauf, Julius Leopold 1907

Elam, John Thomas 1907

Hopkinsville.

Cook, James Otey 1907

Elgin, Lewis Lee 1907

Lexington.

Cooper, James Evans 1907

Harting, Rudolph R. 1902

Louisville.

Bell, Emil Remigius	1890
Curry, Gordon Laten	1900
DIEHL, CONRAD LEWIS	1863
Dilly, Oscar Charles	1888
Dimmitt, Addison	1895
Hurley, Horace Oliver	1907
JONES, SIMON NEWTON	1870
Klein, Nicolas	1907
Krul, John George	1907
McDonald, Harry Stewart	1905
Mueller, Otto Edward	1907
NEWMAN, GEORGE ABNER	1866
Overton, Burr Martin	1903
Peter, Minor Cary	1894
Schlosser, Peter	1902
Schoettlin, Albert John	1882
Treber, Frederick William	1907
Troxler, Constantine, Jr.	1896
Votteler, William	1895
Wassmann, Louis William	1907

Mt. Sterling.

White, Robin Hope	1907
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Newport.

Bange, Otto Franz	1904
Greule, Albert Martin	1903

Paducah.

Koegel, Herman Henry	1907
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Paris.

Clarke, Charles Jordan	1904
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Somerset.

Porter, Chilton Scott	1882
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LOUISIANA.

Baton Rouge.

Maguire, Thomas Joseph	1905
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Covington.

Claverie, Joseph Stanislaus	1904
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Donaldsonville.

Sarradet, Atal August	1905
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Jeanerette.

Quirk, Edmond Charles, Jr.	1904
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Jennings.

Richard, Valleix Bernard	1905
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Monroe.

Allen, William Everett	1905
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New Orleans.

Adams, James Ogilvie	1904
Asher, Philip	1905
Breslin, Michael Thomas	1905
Brown, George Stewart	1900
Capdau, Pierre August	1902
Castillon, Louis Albert	1904
Davis, George Bowditch	1904
Dicks, Frederick Augustus	1905
Earhart, Frederick A.	1904
<i>Finlay, Alexander Kirkwood</i>	1883
Gibson, Robert Henry	1906
Godbold, Fabius Chapman	1887
Guidry, Ambrose Joseph	1903
Henne, Louis E.	1905
Holt, Edwin Merriman	1902
Jacobs, Charles Christian	1901
Katz, Gustave	1903
Killeen, William Patrick	1904
Larsen, John Thomas	1904
Legendre, Joseph Amilcar	1891
Levy, William Michael.	1894
Lyons, Lucien Eugene	1904
Magruder, Charles Galloway	1904
Marion, Etienne James	1903
Metz, Abraham Lewis	1887
Monsabert, Arthur Charles de	1905
Napp, William George	1906
Posey, Henry Gibbon	1905
Quin, Frank Woodard	1902
Richardson, Thomas William	1904
Samson, Max	1900
Sauvinet, Charles Daniel	1902
Villere, Rene Louis	1905
Walsdorf, Charles Albert	1904
Walsdorf, Edward H.	1904
Weilbaecher, Frank Eugene	1904
Wirth, Adam	1904
Wunderlich, Edward	1891

Point Coupee.

Hebert, Joseph Henry	1905
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Pollock.

Bonnette, James Valarus	1902
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MAINE.

Auburn.

Burnham, Ralph Foster	1904
Jones, Oscar Winthrop	1902

Augusta.

Partridge, Frank Reuben	1895
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Bangor.

Davis, Charles Howard.....1903
HARLOWE, NOAH SPARHAWK.....1859
Sweet, Caldwell.....1881

Bath.

Anderson, Samuel.....1876

Biddeford.

Boynton, Herschel1875
Traynor, Charles Francis.....1902

Brunswick.

Leavitt, Adoniram Judson.....1905
Wilson, Frederick Henry.....1906

Danforth.

Porter, Martin Luther.....1904

Kennebunk.

Meserve, Albert Wesley.....1905

Lewiston.

Lowell, Edward Mark.....1896

Orono.

Jackman, Wilbur Fisk.....1899
Seymour, James.....1903

Portland.

Cook, Alfred Page.....1902
Drew, Walter Israel.....1896
Frye, George Carlton.....1879
Hay, Edward Allston.....1889
Morse, Frank Dana.....1902
Perkins, Benjamin Abbott.....1878
Rand, Daniel Moulton.....1892
Schlotterbeck, Augustus George.....1896
Tuttle, George O.....1907

Saco.

Sawyer, Charles Henry.....1896

Skowhegan.

Bucknam, Frank William.....1907

York Village.

Sanford, John Foy.....1902

MARYLAND.

Annapolis.

Henkel, Charles Bernard.....1902

Baltimore.

Baily, G. Frank.....1906
Barnett, Joel Jones.....1899

Base, Daniel.....1898
Bond, John Emory.....1907
Brack, Charles Emil.....1876
Brickman, Arthur Otto.....1898
Bunting, George A.....1907
Burrough, Horace.....1883
Burrough, Horace, Jr.....1901
Campbell, William Lusk.....1905
Caspari, Charles, Jr.....1883
Culbreth, David Marvel Reynolds.....1883
Daneker, Howard Nelson.....1907
Davis, John Alexander.....1894
Dickson, Frederick W.....1906
Dohme, Alfred Robert Louis.....1891
DOHME, CHARLES EMILE.....1863
DOHME, LOUIS.....1859
Downes, Edwin Richards.....1907
Dunning, Henry Armit Brown.....1902
ELLIOTT, HENRY ALEXANDER.....1859
Engelhardt, Hermann.....1907
Feick, Charles.....1901
Fouch, William M.....1906
Frames, John Fuller.....1890
Gilpin, Henry Brooke.....1889
Goodman, Frank Stockett.....1907
Hancock, James Etchberger.....1907
HANCOCK, JOHN FRANCIS.....1863
Hengst, John Edwin.....1900
Heusler, Philip Ignatius.....1903
Hill, Aubrey Thomas.....1907
Hodson, Eugene Withers.....1907
Hynson, Henry Parr.....1890
Kelly, Evander Frank.....1905
Kelly, Thomas.....1907
Kornmann, Henry.....1899
Kosminsky, Leon Joe.....1902
Lillich, Bert Allen.....1907
Lowry, William John, Jr.....1906
Maisch, Henry.....1898
Mansfield, Samuel.....1898
McCartney, Frank Leslie.....1907
Meyer, Adolph Carl.....1905
Meyer, Charles Lewis.....1901
Millard, David Rockwell.....1899
Morgan, Charles.....1899
Muth, George G.....1906
Muth, George Louis.....1894
Muth, John Clement.....1898
Muth, John Sebastian.....1898
Nance, Fuller.....1905
Neal, Charles Chaplin.....1906
Schimmel, Maurice Solon.....1906

Schulze, Louis	1892	BASSETT, CHARLES HARRISON	1867
Schumann, Otto George	1902	Burnham, Alfred Augustus, Jr.	1891
<i>Sharp, Alpheus Phineas</i>	1855	Carter, Frederick Louis	1905
Simon, William	1885	<i>Colton, James Byers</i>	1865
Smith, Frederick Alfred Upsher	1907	Connelly, Frederick William	1907
Srith, Owen Crause	1906	Cramer, Max	1881
Smith, Theodorice	1890	<i>Doliber, Thomas</i>	1859
Stearns, Cletus Otto	1906	DRURY, LINUS DANA	1871
Stichel, William Kleinheim	1907	Durkee, William Carley	1885
Thomas, John Benjamin	1906	Finneran, James Francis	1906
Thomas, Oscar Bernard	1907	Gammon, Irving Parker	1906
Walz, Jacob Lee	1906	Godding, John Granville	1875
Ware, Charles Howard	1898	Griffin, Lyman Whiting	1907
Werckshagen, Otto	1907	Horton, Charles Henry ...	1905
Westcott, James Walling	1890	Jones, James Taber	1875
Williamson, Robert Edward Lee	1898	Lauricella, Felice	1896
WINKELMANN, JOHN HENRY	1864	McCombie, James Newman	1906
Wolf, Charles Augustine	1906	Moxley, Roland R.	1907
Wolf, James Carlton	1905	Pierce, William Herbert	1879
Wolf, Michael Francis	1906	Sawyer, William Frederick	1885
<i>Brookville.</i>		Sharples, Stephen Paschell	1875
Howard, Henry	1905	SHEPPARD, SAMUEL ARUS DARLINGTON	1865
<i>Chester town.</i>		Simonsen, Louis	1904
Toulson, Milbourne Asbury	1905	Thompson, Leon Albert	1907
<i>Frederick.</i>		Tucker, Greenleaf Robinson	1890
Pearré, Albert Lindsay ...	1906	Vargas-Heredia, Jorge	1891
<i>Hagerstown.</i>		West, Charles Alfred	1892
Aughinbaugh, David Culbertson	1898	Wheeler, William Dexter	1892
Meredith, Harry Lionel	1900	Williams, George Gorham	1888
WINTER, JONAS	1863	WILSON, BENJAMIN OSGOOD	1859
<i>Hancock.</i>		<i>Brockton.</i>	
Hook, James Patrick	1905	Randall, Frank Otis	1893
<i>Roland Park.</i>		<i>Brookline.</i>	
Bacon, Ephraim	1905	Burke, Walter Jordan	1907
<i>Snow Hill.</i>		Clapp, Lowell Tuckerman	1905
Powell, William Cottingham	1895	Gerald, Herbert Franklin	1906
<i>Taneytown.</i>		<i>Cambridge.</i>	
McKinney, Robert Sentman	1898	Claffin, Walter Addison	1896
MASSACHUSETTS.		O'Leary, James Patrick	1907
<i>Amherst.</i>		Phillips, Carrie Elizabeth	1854
Denel, C. Fred	1907	Seaverns, Martha Gilbert	1902
<i>Boston.</i>		<i>Cambridgeport.</i>	
Baird, Julian William	1894	La Pierre, Elie Henry	1892
Baker, Walter Nelson	1906	Norton, George Edward	1895
		<i>Charlestown.</i>	
		STACEY, BENJAMIN FRANKLIN	1800
		<i>Concord.</i>	
		Richardson, Horatio Stillman	1892

Dorchester Centre.

Davis, Charles Henry 1907
 Tripp, Arthur Horton 1906

East Boston.

Packard, Charles Herbert 1906

East Weymouth.

Hoyt, George Melvin 1904

Everett.

Wagner, Arthur Carl 1907

Fairhaven.

Snow, Levi Morton 1905

Fall River.

Riddell, Benjamin Franklin 1892

Fitchburg.

Coté, André Alexandre 1904

Day, Edward John 1901

Estabrook, Henry Arthur 1886

Holyoke.

Ball, Charles Ely 1885

Heinritz, Lebrecht Gustav 1902

Hudson.

Wheeler, Carlton Bancroft 1907

Hyde Park.

Reemie, Edgar Warren 1905

Jamaica Plain.

Lewis, Ernest Grant 1892

Smith, Linville Holton 1892

Lawrence.

Bower, Edward A. 1907

Glover, William Henry 1891

Smith, Albert Burnham 1907

Leominster.

Nixon, Charles Frederic 1900

Lowell.

BAILEY, FREDERICK 1869

HOOD, CHARLES IRA 1871

Willson, George Arnold 1906

Ludlow.

Booth, Albert Edward 1907

Malden.

Keaney, James John 1899

Marlboro.

Barnard, Harry A. 1907

Gorman, Mary Cecilia 1907

Mattapan.

Best, Samuel M. 1906

New Bedford.

BLAKE, JAMES EDWIN 1866

SHURTLEFF, ISRAEL HAMMOND 1875

Newburyport.

Castlebun, Karl 1902

Davis, Charles Leland 1897

Goodwin, William Wells 1853

Newton.

Crowdle, John Edward 1894

Hubbard, Frederick Arthur 1907

Hudson, Arthur 1882

Newton Centre.

Hassett, Thomas Bernard 1907

Pittsfield.

Engstrom, Ernst Oscar 1906

Provincetown.

Adams, James Holmes 1906

Raynham.

Crossman, George Alvin 1872

Revere.

Larrabee, Charles William 1906

Roxbury.

Ryder, Horace Foster 1907

Salem.

Nichols, Thomas Boyden 1876

Price, Charles Henry 1882

Price, Joseph 1888

Shelburne Falls.

Baker, Edwin 1875

Southborough.

Newton, Robert Albro 1906

Springfield.

Adams, Henry ... 1904

Erck, Philip Frederick 1906

Stonham.

Patch, Edgar Leonard 1872

Waltham.

Gleason, Patrick Sebastian..... 1904

Worcester.

Brewer, Howard Dickinson..... 1902

Cutler, Bertram Crocker..... 1905

Guerin, James Francis..... 1898

Scott, George Theodore..... 1883

MICHIGAN.

Ann Arbor.

Calkins, Eleazer E..... 1903

EHERBACH, OTTMAR..... 1869

Eckler, Charles Ralph..... 1903

Schlotterbeck, Julius Otto..... 1888

Stevens, Alviso Burdette..... 1885

Berrien Springs.

Kephart, Philip..... 1902

Cadillac.

Webber, Arthur H..... 1903

Detroit.

Allen, William Humphries..... 1902

Averyt, Henry Madison..... 1907

Blome, Walter Henry..... 1903

Francis, John Miller..... 1906

Hall, William Alanson..... 1888

Helfman, Joseph..... 1894

Houghton, Elijah Mark..... 1889

Iltis, George Washington..... 1905

Knox, James Wesley Thompson..... 1898

Lyons, Albert Byron..... 1885

MacFadden, Warren Lester..... 1902

Mallard, A. E..... 1907

Mann, Charles Frederick..... 1903

Mason, Harry Beckwith..... 1896

McClure, Clarence Minor..... 1907

Nelson, Edwin Horatio..... 1904

Ohliger, Willard..... 1903

Perry, Frederick William Riley..... 1885

Roll, Tod B..... 1906

Ryan, Frank Gibbs..... 1892

Scoville, Wilbur Lincoln..... 1891

Seltzer, Leonard Adams..... 1899

Vernor, James..... 1866

Wheeler, A. Alton..... 1906

Flushing.

Sprague, Wesson Gage..... 1895

Grand Rapids.

Dutmers, Cornelius John..... 1905

Kirchgesner, William Carl..... 1903

Muir, John Davidson..... 1903

Peck, Percy Seaman..... 1903

Schmidt, Walter Karl..... 1903

Stowe, Ernest A..... 1904

Timmer, Jacob Berend..... 1904

Holly.

Gidley, William Francis..... 1907

Ionia.

Gundrum, George..... 1882

Kalamazoo.

Todd, Albert May..... 1885

Lansing.

Holm, Marinus Larsen..... 1905

Monroe.

Hagans, Daniel Allen..... 1903

Mount Clemens.

Schanher, Paul..... 1905

Pontiac.

Cloonan, Martin John..... 1904

Saginaw.

Heim, Henry..... 1900

Prall, Delbert Elwyn..... 1902

MINNESOTA.

Arcoa.

Bachman, Gustav..... 1905

Duluth.

Abbott, William Allen..... 1901

LeRicheux, Alfred Charles..... 1901

Sweeney, Robert Crosby..... 1866

East Grand Forks.

Kingman, Ignatius..... 1904

Jackson.

Colby, Charles Ludwig..... 1904

Mankato.

Lamm, Edward Leo..... 1906

Weed, Nelson..... 1905

Minneapolis.

Allen, E. Floyd..... 1885

Danek, John Francis..... 1895

Gamble, Stewart 1897
 Huhn, Charles Hugo 1905
 King, George Alexander Newton 1892
 Sweet, William Herbert 1905
 Thompson, Albert Delano 1895
 Voegeli, Thomas 1905
 Wanous, Josephine Anna 1897
 Wittich, Matthew Henry 1897
 Wulling, Frederick John 1893

New Ulm.

Alwin, William Gustav 1904
 Eckstein, Andrew Joseph 1895

Ortonville.

Nielson, John 1897

Pelican Rapids, Otter Tail Co.

Axness, Ole Mikkelsen 1895

St. Paul.

Campbell, Albert Alexander 1902
 Collier, William Kelly 1897
 Conger, Stephen Benson 1907
 Frost, William Arthur 1892
 Heller, Charles Tomkins 1906
 Jelinek, John Peter 1907
 Parker, Frederick M. 1902
 Schumacher, Albert John 1904

Two Harbors.

Elfstrand, Wilhelm 1905

Winona.

Lauer, Joseph William 1904
 Leeb, Theodore Feargod 1903

MISSISSIPPI.

Aberdeen, Monroe Co.

Eckford, Joseph William 1883

Columbus.

Caine, S. Lee 1904

Durant.

Nicholson, Gilbert Walne 1905

Ellisville.

Hyde, Milton Warren 1905
 Ward, Enoch James 1905

Hattiesburg.

Dozier, William Alney 1905

Laurel.

Polk, Martin Luther 1904

Meridian.

Bethea, Oscar Walter 1902
 Hammond, E. Emmet 1905
 Holt, Julian Woods 1905
 Humphries, John Randolph 1905
 Renfro, Harris Burt 1904

Osyka.

Coody, Archibald Stinson 1906

Port Gibson.

Shreve, John Alexander 1880

Richton.

Brill, Paul D. 1905

Summit.

Covington, Samuel Maurice 1906

Tchula.

Alexander, John Mills 1905

MISSOURI.

Boonville.

Mittelbach, William 1891

Carrollton.

PETTIT, HENRY McEWEN 1860

Centralia.

Hope, Robert Lee 1901

Clayton, St. Louis Co.

Greensfelder, Harry 1904

Georgetown.

Dow, John P. 1904

Hannibal.

Ayres, Albert John 1907

Jefferson City.

Brandenberger, Adolph 1894

Kansas City.

Breunert, August 1901
 Crampton, Ferd Leslie 1896
 Davis, Harry Roy 1904
 Dicky, Charles Francis 1904
 Eyssell, George 1889
 Federmann, William Martin 1901
 Griffiths, Joseph 1901
 Hess, Paul Ludwig 1892

Lee, Richard Henry	1904	Judge, Charles Rogers	1901
Reymond, John Paul	1903	Kleinschmidt, Augustus Anton	1903
Vincent, Frederic Arthur Charles	1904	Klie, George Henry Charles	1878
Whitney, David Victory	1903	Koeneke, Charles Henry	1901
Wirthman, John George	1903	Kurtz, Irving William	1904
Wirthman, Joseph Charles	1903	Lamar, William Robinson	1901
<i>Linn Creek.</i>			
Moulder, Bettie Leona	1905	Leftwich, Harry Percy	1906
<i>Maitland.</i>			
Nie, Henry Joseph	1905	MALLINCKRODT, EDWARD	1869
<i>Marysville.</i>			
Orear, Edwin George	1904	May, Charles Charlotte	1898
<i>Mexico, Audrian Co.</i>			
LLEWELLYN, JOHN FREDERICK	1867	Merrell, George Robert	1901
<i>Nevada.</i>			
Ballagh, Wilfred Thomas	1901	Merrell, Hubert Spencer	1903
Pierce, Fred	1903	Meyer, Theodore Frederick	1901
<i>New Madrid.</i>			
Hummel, John Andrew	1901	Noll, Martin James	1898
<i>Plattsburg.</i>			
Carmack, George Ward	1903	Pauley, Frank Charles	1879
<i>Sedalia.</i>			
Bard, William Evans	1901	Perry, Frank Vinton	1907
SMITH, OTIS WILMER	1903	Philibert, Leon David	1901
<i>St. Louis.</i>			
Blakeslee, Louis G.	1903	Queeny, John Francis	1905
BOEHM, SOLOMON	1871	Reilly, Robert Charles	1901
Boesewetter, Richard	1902	Riley, Cassius Marcellus	1901
Carter, Frederick James	1905	Riley, Russell	1901
Caspari, Charles Edward	1902	SANDER, ENNO	1858
Claus, Otto Ferdinand	1901	SCHEFFER, HENRY WILLIAM	1863
Collins, Albert Noel	1905	Schlueter, Robert Ernst	1904
Duering, Henry Charles	1901	Schoenthaler, John Paul	1901
Euler, Frederick Christopher	1901	Seitz, Lorenz Aloysius	1901
Falk, John Charles	1900	Sennewald, Emil August	1900
Fischer, John Frederick Henry	1901	Stolle, Henry Jasper	1903
Fricke, Frederick Henry	1901	Sultan, Frederick William	1901
Gietner, Charles	1905	Sum, Francis	1904
GOOD, JAMES MICHENER	1871	Suppan, Leo Richard August	1904
Grew, Louis Frederick	1901	Temm, William Daniel	1901
Hagee, William Price	1901	Uhlich, Ferdinand Gottlieb	1881
Hagenow, Theodore Frederick	1901	VORDICK, AUGUST HENRY	1874
Hahn, Charles William John Henry ..	1901	Walbridge, Cyrus Packard	1901
Hemm, Francis	1881	Wall, Otto Augustus	1884
Ilhardt, William Kellerman	1901	WHELPLEY, HENRY MILTON	1887
Ittner, William Frederick	1903	Whitcomb, Frederick Ezekiel	1888
		Wolff, Edward Henry	1901
<i>Vandavia.</i>			
		Johnson, Marcy Marion	1907
		Morgan, Thomas, Jr.	1905
<i>Warrensburg.</i>			
		Murray, Julius Victor	1905
		Sorency, Robert	1903
<i>Washington.</i>			
		Gallenkamp, Edward William	1903
<i>Webb City.</i>			
		Wade, Guy Leland	1905
		Wright, Charles Lewis	1901

Webster Groves, St. Louis Co.

Mueller, Ambrose 1894

Williamstown.

Felker, Walton Arthur 1904

Windsor, Henry Co.

Wesner, Henry Clay 1901

MONTANA.

Billings.

Warren, Lee 1907

Butte.

Rockefeller, Howard 1900

Livingston.

Scheuber, Frank Augustus 1905

NEBRASKA.

Auburn.

Dort, Edward Harvey 1903

Fairbury.

Pease, Autumn Vine 1893

Fremont.

Koss, Frank 1907

Kreizinger, Karl L. 1907

Greeley.

Clough, Frank Harrington 1905

Holdrege.

Fink, Daniel Jacob 1903

Kearney.

Hansen, Neils P. 1906

Lincoln.

Haschenburger, Edmund Ommen ... 1907

McCook.

McConnell, Lewis William 1904

Norfolk.

Christoph, George Benjamin 1905

Oakland.

Simon, Frank 1907

Omaha.

Mares, Ferdinand Louis 1897

Myers, Preston B. 1897

Sherman, Charles Rollin 1889

Plattsmouth.

Fricke, Frederick George 1903

Gering, Henry R. 1907

Superior.

Kendall, Wallace Warren 1903

NEW HAMPSHIRE.

Berlin.

Lyford, Earle Howard 1903

Dover.

Rollins, John Francis 1859

Littleton.

Robins, Wilbur Fiske 1872

Manchester.

Knowlton, George Harry 1907

Portsmouth.

Grace, William Day 1896

Green, Benjamin 1888

Somersworth.

Hurd, John Charles 1892

West Derry.

Bell, Samuel Howard 1890

NEW JERSEY.

Atlantic City.

Deakyn, Harry Hartup 1905

Dulaney, Joseph Field 1902

Ridgway, William Frederick 1902

Wescott, William Carter 1896

Bernardsville.

Squibb, Charles Fellows 1901

Bridgeton.

Dare, Charles Ford 1889

Jorden, Henry Albert 1902

Whipple, George Henry 1902

Camden.

Barrett, Charles Llewellyn 1902

Beringer, George Mahlon 1893

Beringer, George Mahlon, Jr. 1905

Weiser, William Peiffer 1902

Collingswood.

Chamberlin, William Allan 1906

Vanderkleed, Charles Edwin 1902

East Orange.

Williams, Seward Whiting 1887

Elizabeth.

FROHWEIN, RICHARD 1867

Kent, Henry Avery, Jr. 1880

Oliver, William Murray 1875

Schmidt, Henry 1904

Stutzlen, Frank Charles 1902

Englewood.

Brown, Lewis W. 1907

Freehold.

Lehritter, George Peter 1902

Fort Lee.

Kaiser, Herman W. 1907

Haddonfield.

Willard, Rowland 1902

Hoboken.

KLUSSMANN, HERMANN 1876

Sieker, Ferdinand August 1893

Jersey City.

Abernethy, Maxwell 1865

Foulke, James 1881

Gallagher, John Charles 1803

Lohmann, Herman J. 1896

Stein, Edward Theodore North 1902

Jersey City Heights.

Bongartz, Ferdinand Alphonse 1905

Kuehne, Charles 1902

Kearny.

Shaak, Franklin Philip 1906

Keyport.

Warn, William Edgar 1886

Lakewood, Ocean Co.

Harrison, William John 1896

Linden.

Dougherty, Samuel Edward 1875

Matawan, Monmouth Co.

Slater, Frank Hovey 1882

Medford.

Thorn, Henry Prickett 1879

Milburn.

Campbell, George Stelle 1905

Montclair.

Dohme, William Ignatius 1907

Wensch, Henry Ernest, Jr. 1902

Morristown.

Betzler, Jacob 1880

CARRELL, EUGENE A. RES. 1875

Newark.

Bear, Pierce B. 1905

Coleman, John H. 1902

Eckert, John 1902

Foster, John Benjamin 1901

Hain, Frank William August 1905

HOLZHAUER, CHARLES 1873

Holzhauer, Charles William 1907

Mcuk, Charles William 1898

Smith, Clarence Pennington 1890

Staehle, Louis Lorenz 1898

Stamford, William Harrison 1876

Wuensch, Charles 1898

New Brunswick.

KILMER, FREDERICK BARNETT 1886

Rust, Schuyler Scott 1905

Orange.

Sayre, Edward Augustus 1877

Paterson.

Mackey, James Campbell 1905

Perth Amboy.

Parisen, George Warren 1892

Seaman, Frederick A. 1905

Phillipsburg.

Anewalt, Ellsworth Quincy 1901

Plainfield.

Schreiner, Robert 1906

Red Bank.

Van Derveer, Robert Hutchinson 1903

Roebling.

Hires, Lewis Moore 1907

Shrewsbury.

Hazard, Elmer Clarke 1902

South Amboy.

JACQUES, GEORGE WASHINGTON 1869

South Orange.

Feindt, Louis F. 1906

Trenton.

Cook, Elliott Daniel 1906

Union Hill.

Neu, Daniel Alfred 1903

Verona, Essex Co.

Rich, William Pitt 1902

Vineland.

Newcomb, Edwin Leigh 1906

West Hoboken.

Maggio, James Innocenzo 1907

• NEW MEXICO.

Fort Stanton.

Van Ness, George Ide 1904

NEW YORK.

Albany.

Bradley, Theodore James 1896

Bradt, Warren Lansing 1903

Dillenback, Garrett Van der Veer 1902

Gaus, Charles Henry 1879

Husted, Alfred Birch 1879

Michaelis, Gustavus 1882

Taylor, Henry Lewis 1906

Auburn.

Adams, Arthur Ellison 1902

Sears, Charles Barager 1906

Bayside, L. I.

Gregorius, William Paul 1907

Binghamton.

Nelson, Burt Everett 1902

Brooklyn.

Anderson, William Christine 1900

Bartley, Elias Hudson 1893

Brooks, George Washington 1879

Cantor, Lorentz 1907

DeForest, William Pendleton 1879

DeJonge, Cornelius 1899

Dewender, William Henry 1896

Dissosway, Thurston N. 1905

Douglas, Henry 1875

DUNN, JOHN AUGUSTUS 1867

Eccles, Robert Gibson 1885

Englander, Samuel 1899

Fischer, Albert 1904

FOUGERA, EDMUND CHARLES HENRY. 1890

Hereth, Franklin Samuel 1893

Kleine, Oscar Clemens, Jr. 1903

Lo Sardo, Antonino 1902

May, Louis 1902

Mayer, Joseph L. 1905

McElhenie, Thomas DeArmond 1872

McMahon, Joseph 1897

Muir, William 1907

Myerson, Isaac Aaron 1906

OWENS, RICHARD JOHN 1860

Raubenheimer, Otto 1902

Rosenzweig, Benjamin 1898

Schaak, Milton Franklin 1906

Snyder, Ambrose Chancellor 1867

Stenbuck, Moses Abraham 1907

Tuthill, Frederic Percival 1899

Waldner, Paul Jacob 1900

Warner, Louis Henry 1907

Webber, Joseph LeRoy 1886

Werner, Rudolph Carl 1882

Wicke, Otto 1907

Wyckoff, Elmer E. 1906

Buffalo.

Bentz, Henry George 1904

Dimond, Harry John 1904

Gregory, Willis George 1886

Hayes, Horace Phillips 1880

Rano, Charles Orlando 1866

Reimann, George 1902

Richardson, Samuel William 1897

Stoddart, Thomas 1900

Cambridge.

Richardson, Frank 1906

Catskill.

Du Bois, William Laneman 1880

College Point.

Hartz, Johann Daniel August 1902

Klein, Edward Nichols Emil 1905

Corning.

Cole, Victor Le Roy 1890

Croton-on-Hudson.

Henry, Charles (Dworniczak) 1881

Dannemora.

Sloss, Robert Audley 1901

Dunkirk.

Davis, Eugene Miller 1892

Ellis Island.

Macdowell, William Foster.....	1904
Neves, George	1904
O'Gorman, Theophilus Vincent	1897

Elmira.

HOLMES, CLAYTON WOOD	1873
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Flushing.

Hepburn, John.....	1873
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Geneseo, Livingston Co.

Rogers, Arthur Henry.....	1882
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Middletown.

KING, JAMES THEODORE.....	1859
ROGERS, WILLIAM HENRY.....	1869
Shimer, Samuel Mortimer.....	1904

Monticello.

Isakovics, Alois von	1905
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Mount Vernon.

Rauschenberg, Sidney.....	1900
Stone, Clarence George	1901

New York City.

Allison, William Outis.....	1895
Alpers, William Charles	1890
Balser, Gustavus.....	1875
Baltzly, Albert Bates.....	1907
Beilstein, Christian	1907
Berger, Louis.....	1907
Bigelow, Clarence Otis	1900
BILLINGS, HENRY MERRY.....	1869
Boeddiker, Otto.....	1895
Brucker, Carl Friederich Jacob	1902
Brunor, Emile	1904
CHANDLER, CHARLES FREDERIC	1867
Coblentz, Virgil	1882
Cohn, Alfred I.	1905
Collins, Mary Elizabeth	1902
Cook, Thomas Penrose.....	1877
Cowan, John.....	1897
Craig, Hugh.....	1907
Daggett, Volney Chapin.....	1901
Diamond, Peter	1905
Diekman, George Charles.....	1898
Diner, Jacob.....	1906
Duble, Jesse Balderston	1904
Elliott, Boyce	1906
Ennis, Ephraim Leonard	1906

Erhart, William H.....	1907
Evans, William James.....	1904
Faber, Walter Eberhard.....	1900
Fairchild, Benjamin Thomas	1875
Fairchild, Samuel William	1887
Feinberg, Maurice Mandel.....	1905
Ferguson, George A.....	1905
Flowers, Hiland.....	1904
Fraser, Horatio Nelson.....	1888
Gable, Ralph Benton	1902
Gane, Eustace Harold.....	1895
GARDNER, ROBERT WINSLOW	1867
Geisler, Joseph Frank.....	1889
Geisler, Leo Waldemar, Jr.	1904
Green, Edward T.	1905
Gregorius, George Gustavus Chas. Wm.....	1898
Hackenberg, George Washington ..	1907
Haddad, Saleem Faris.....	1902
Hamann, William A.	1907
Harkany, Samuel.....	1907
Harris, Norman B.	1904
Harson, Henry.....	1906
Hatcher, Robert Anthony	1905
Hauenstein, William.....	1883
Havenhill, L. D.	1900
HAYNES, DAVID OLIPHANT	1887
Hays, Francis Banks.....	1902
Henning, Adolph	1905
HEYDENREICH, EMILE	1867
Hirseman, Felix.....	1907
Hitchcock, George Henry	1902
Hopkins, Jesse L.	1898
Hudnut, Richard Alexander	1899
Jelliffe, Smith Ely	1895
Jungmann, Julius.....	1879
Kalish, Julius	1875
Kalish, Oscar G.	1900
Kantrowitz, Hugo	1907
Keenan, Thomas John	1894
Kemp, Edward.....	1903
KENNEDY, EZRA JOSEPH.....	1887
Kirchgasser, William Charles.....	1888
Koch, William Julius	1907
Lampa, Robert Raymond.....	1892
Lascoff, Jacob Leon	1903
Latham, Thomas	1907
Lovis, Henry Christian	1892
MAIN, THOMAS FRANCIS.....	1872
Mansfield, William	1907
Mariamson, Max	1902
Mayo, Caswell Armstrong	1893
McCoy, James Edward	1907

MCINTYRE, EWEN	1873
MCINTYRE, EWEN, JR.	1903
McKesson, Donald	1906
McKesson, George Clinton	1888
McKESSON, JOHN, JR.	1867
<i>Mohr, Ernst</i>	1867
Moore, Thomas Henry	1907
Murray, Benjamin Lindley	1896
Niece, Frederic Ellwood	1903
O'Neil, Henry Maurice	1879
Pennoch, Edward	1898
Pfaff, Edward Franz	1907
Plaut, Albert	1894
Pond, Raymond Haines	1903
Quackinbush, Benjamin Franklin	1886
Ramsdell, Clifford	1907
Ramsey, George	1907
RAMSPERGER, GUSTAVUS	1860
Rippetoe, John Ross	1907
Robinson, William Josephus Marir	1902
RUNYON, EDWARD WHELOCK	1875
Rusby, Henry Hurd	1890
Sacks, Bernard	1907
Salem, Louis Napoleon	1905
Sawyer, Edward Sands	1904
Schenck, Henry	1903
Schieffelin, William J.	1892
Schimpf, Henry William	1894
Schleussner, Charles Frederick	1902
Schmid, Henry	1887
Schnell, Harry Julius	1906
Schweinfurth, George Edward	1907
Scott, Harry	1907
SEABURY, GEORGE JOHN	1876
SKELLY, JAMES JOSEPH	1866
Spring, George Alexander	1907
Stephenson, John Joseph	1905
Swann, Samuel Van Buren	1903
Takamine, Jokichi	1898
Weicker, Theodore	1905
Weinstein, Abraham	1904
Weinstein, Joseph	1905
Weiss, Emil Otto	1907
White, Charles Hugh	1902
Wichelns, Frederick	1881
WICKHAM, WILLIAM HULL	1870
Wilson, William Henry	1907
Wimmer, Curt Paul	1907
Wolf, Gustave	1903
Wooyenaka, Keizo	1907
<i>Plattsburg.</i>	
Hitchcock, John E.	1892

Port Richmond.

Kerr, Frederick William 1905

Richfield Springs.

Smith, Willard Alfred 1880

Saratoga Springs.

FISH, CHARLES FREDERICK 1866

Stapleton, Staten Island.

Becker, Ulrich William 1904

Roebig, Albert Michael 1902

Rogers, Edward 1902

Syracuse.

Dawson, Edward Seymour, Jr. 1876

Muench, William 1899

Smith, Rufus E. 1907

Snow, Charles Wesley 1876

Utica.

Blaikie, William 1879

Evans, Arthur S. 1907

Slauson, John G. 1907

Watson, William, Jr. 1902

Yonkers.

Petsche, Franz Fried. Bismarck Wilhelm . 1892

NORTH CAROLINA.

Asheville.

Pfaffin, Henry Adolph 1892

Chapel Hill.

Howell, Edward Vernon 1900

China Grove.

Swaringen, DeWitt Clinton 1905

Durham, Orange Co.

Vaughan, Parry Wyche 1882

Fayetteville.

Horne, Warren Winslow 1902

Kinston.

Hood, William Dameron 1905

New Bern.

Bradham, Caleb Davis 1902

Rowland.

Ward, Homer Benjamin 1901

Scotland Neck.

Whitehead, Eugene Thomas 1900

<i>Tarboro.</i>		Fennel, Charles Theodore Fiderit...	1886
ZOELLER, EDWARD VICTOR	1878	Fieber, Gustavus Adolphus	1893
<i>Williamston.</i>		Forbes, James Winchell	1905
Biggs, Warren H	1905	Freericks, Frank Herman	1905
<i>Wilmington.</i>		French, Rolland Hall	1903
Hardin, John Haywood	1881	Gansz, William Henry	1905
NORTH DAKOTA.		<i>Gordon, William John Maclester ..</i>	<i>1854</i>
<i>Fargo.</i>		Greyer, Julius	1880
Wilser, Joseph Michael Stephen	1906	Katz, Otto	1904
<i>Grafton.</i>		Kisker, Frederick William	1906
Haussamen, Henry Louis	1906	Kistner, Otto Emil	1906
<i>Kathryn.</i>		Kutchbauch, John Frederick	1904
Simmons, Gustav Tobias	1903	LLOYD, JOHN URI	1870
<i>Mandan.</i>		Merrell, Charles George	1888
Bromme, William Louis	1907	Merrell, George	1879
OHIO.		Overbeck, Bernard Henry, Jr.	1906
<i>Ada.</i>		Serodino, Herman	1880
Mohler, David Christian	1906	Stier, George F.	1907
<i>Akron.</i>		Voss, Edward, Jr.	1904
Collins, Frank Askew	1906	Wetterstroem, Theodore David	1897
Dutt, William	1905	YORSTON, MATTHEW MACKAY	1864
Harper, Charles Bennett	1904	Zorn, Emil	1904
Lemasters, William Otterbein	1905	Zuenkeler, John Ferdinand	1887
<i>Ashtabula.</i>		Zwick, Albert Otto	1904
Allen, Andrew Campbell	1905	<i>Circleville.</i>	
<i>Barnesville.</i>		Fickardt, Frederick Lutz	1904
Ely, Ernest Sykes	1904	<i>Cleveland.</i>	
<i>Belleue.</i>		Arny, Harry Vin.	1891
Brinker, John Henry	1906	Bechberger, Henry	1904
<i>Canton.</i>		Beckenbach, Edward	1904
Jones, Ernest	1905	Benfield, Charles William	1893
Roth, Charles Robert	1900	Boldt, Frederick William	1905
Schlabach, Edward John	1904	Brown, Charles Malvern	1902
<i>Charlton.</i>		Cobb, Ralph Lathrop	1883
Gape, Arthur Garfield	1904	Drach, George Louis	1902
<i>Chillicothe.</i>		Drake, Wallace Clinton	1902
Howson, Arthur Bayshawe	1886	Feil, Joseph	1885
<i>Cincinnati.</i>		Fischer, Henry John	1902
Apmeyer, Charles Ascau	1906	Fox, Willard Milton	1903
Brand, Joseph Henry	1904	Gausby, Robert Arthur	1904
DeLang, Alfred	1887	Gehrun, John Michael	1905
		Haake, William Henry	1893
		Hankey, William Tabor	1902
		Hannan, Owen Burdette	1893
		Hechler, Edward Henry	1904
		Hopp, Lewis Christopher	1876
		Krause, John	1906
		Krejci, Leo Charles	1907
		Kuder, William Frank	1893
		Lehr, Philip	1885
		Matousek, James Thomas	1905

McDonald, Walter David.....	1905	<i>Dresden.</i>	
Miller, Frederick John	1902	Nicholson, Ralph Burt.....	1905
Mitermiller, John Alfred	1903	<i>East Liverpool.</i>	
Muhlhan, Otto Emil	1905	Holloway, Jesse Daniel.....	1905
Neuberger, Joseph Anton.....	1904	<i>Grand Rapids, Wood Co.</i>	
Oertel, Alfred Augustus	1903	THURSTON, AZOR.....	1886
Placak, Harry.....	1902	<i>Hillsboro.</i>	
Pratt, Thomas Matthew	1906	Garrett, Oscar Newton	1902
Rosenberg, Samuel Solomon	1907	McClure, Clarence Minor.....	1907
Schellentrager, Ernst August.....	1906	<i>Holloway.</i>	
Schmitt, Carl.....	1906	Murphy, Charles Corliss	1904
Schoenhut, Christian Henry.....	1888	<i>Hopedale.</i>	
Selzer, Eugene Reinhold	1893	Stringer, Orum Hines	1905
Sherwood, Henry Jackson	1894	<i>Logan.</i>	
Sieplin, Charles Augustus.....	1904	Harrington, Frank.....	1869
Sords, Thomas Vincent.....	1893	<i>Magnolia.</i>	
Southard, Frank Allan	1903	McIlravy, Maude Jeanette	1903
Stern, August Otto.....	1904	<i>Martinsburg.</i>	
Tielke, Maxwell Gustave.....	1904	<i>Massilon.</i>	
Voss, George William.....	1885	Baltzly, Zachariah Taylor	1905
<i>Columbiana.</i>		<i>Mingo Junction.</i>	
Ink, Charles Elliott.....	1885	Bryson, William Smith	1905
<i>Columbus.</i>		<i>Navarre.</i>	
Ackerman, Philip Jacob	1906	GROSSKLAUSS, JOHN FERDINAND. ...	1859
Dye, Clair Albert.....	1901	<i>Norwood.</i>	
Haney, Thomas Carlyle	1903	Bunnell, Lynn Lester	1906
Hatton, Ellmore Wright.....	1894	<i>Pomeroy.</i>	
Herpich, John Le Dure	1906	Roush, Frederick Alman.....	1905
Kaemmerer, William Frederick.....	1899	<i>Ripley.</i>	
Kauffman, George Beecher	1882	Crook, Frank Richards	1905
MATSON, GEORGE HIRAM, JR.	1869	<i>Scio.</i>	
Ogier, William Robert	1901	Beal, George Denton	1907
Rauschkolb, John	1894	Beal, James Hartley	1892
Sauerbrun, Otto Orville.....	1905	Creighton, Mary Louisa	1903
Schueller, Frederick William	1880	<i>Springfield.</i>	
Webb, Edward Nathan	1905	CASPER, THOMAS JEFFERSON	1867
Wendt, William Carl.....	1901	Siegenthaler, Harvey Newton.....	1882
<i>Conneaut, Ashtabula Co.</i>		<i>Strasburg.</i>	
Dexter, Thomas Harold	1905	Stanbarger, Morris Howard.....	1906
Symonds, Arthur Henry	1892		
<i>Dalton.</i>			
White, Albert J.	1907		
<i>Delphos.</i>			
Ford, Myron Nile	1905		
<i>Demos.</i>			
Maybew, Earle William	1905		
<i>Dennison.</i>			
Lanning, Adrian Roy	1904		

Toledo.

Bowman, Waldo Moffett.....	1905
Huston, Thomas Benton.....	1904
Lembke, Carl Henry Frank.....	1907
Loesser, Paul A.....	1906
Ludwig, William Edward.....	1904
Rex, Clarence R.....	1905

Upper Sandusky.

Von Stein, John Henry.....	1904
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Washington.

Warfield, James Allen.....	1905
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Wooster.

OHLIGER, LOUIS PHILIP.....	1871
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Youngstown.

Cassaday, Orlin Ulysses.....	1899
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OKLAHOMA.

Carnegie.

Bailey, William Edgar.....	1906
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Checotah.

Kniseley, Herman Dee.....	1905
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Durant.

Schenk, Fannie Kennedy (Mrs.)....	1906
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Geary.

Neal, Thomas Lindsey.....	1904
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Granite.

Davenport, Emmett Henry.....	1905
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Guthrie.

Lillie, Foress Ball.....	1900
Spangler, Newton Light.....	1906

Hennesey.

Dinkler, Frank A.....	1900
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Lexington.

Johnston, George Pembroke.....	1905
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Muskogee.

Cobb, Henry C.....	1905
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Norman.

De Barr, Edwin.....	1905
Washburn, Homer Charles.....	1905

Seiling.

Daniels, Wilbur Wellington.....	1905
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Shawnee.

Clark, Arthur Benjamin.....	1906
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Stroud.

Burton, John Clement.....	1902
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Welch.

Kinnison, Virgil A.....	1904
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OREGON.

Ashland, Jackson Co.

McNair, John Sydenham.....	1902
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Marshfield.

Brown, James Lee.....	1903
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Oregon City.

Harding, George Albert.....	1907
Huntley, Clyde Gibson.....	1904

Portland.

Laue, John Max Alfred.....	1904
Robertson, Felix Otey.....	1890

Salem.

Harbord, Kittie Walker.....	1905
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The Dalles.

Blakeley, George Clarence.....	1892
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Union.

Reuter, Walter Henry.....	1907
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PENNSYLVANIA.

Allegheny City.

Gleghorn, James Seymour.....	1900
Malloy, William Bernard.....	1905
Walter, Peter G.....	1905

Beaver, Beaver Co.

Andriessen, Hugo....	1875
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Braddock.

Kutscher, George William.....	1905
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Brownsville.

Graham, Charles Robert.....	1906
Risbeck, John Matthew.....	1905

Butler.

Minesinger, Norman Wilhelm.....	1906
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Canonsburg.

Morrison, George Shattuck.....	1905
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Carlisle.

Horn, Wilbur Fisk.....	1876
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Chambersburg.

Greenawalt, S. Miller.....	1907
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Columbia.

Zeamer, Harry Wisler 1905

Connellsville.

Berryhill, Henry Pennick 1890

Hetzal, Chauncy Roy 1905

Corsica.

Scott, Henry Reyburn 1905

Crafton.

Holsopple, J. Bert 1905

Kossler, Herman S. 1905

Du Bois.

Hay, Charles La Mar 1898

Duquesne.

Malloy, Michael John Lawrence. 1905

East Brady.

Lindsay, Robert Aurley 1907

Easton.

Anspach, Paul Bucher 1903

Voorhees, Harry Burns 1906

Edinburg.

Burke, Madge Adeline 1905

Edwardsdale.

Lohman, John 1904

Elkins Park.

Osborne, Melmoth Mercer 1906

Franklin.

McGarr, Cuvier Lee 1905

Freedom.

Gruen, John George 1906

Harrisburg.

GEORGE, CHARLES THEODORE 1873

Gorgas, George Albert 1884

Müller, Jacob Augustus 1873

Smith, Benjamin Franklin 1892

Harrisville.

Cochran, William Medardus 1906

Healboro.

Rothwell, Walter 1907

Haverford.

Harbaugh, Wilson Linn 1896

Homestead.

Hantz, Charles Nelson 1906

Lebovitz, Louis 1905

Johnstown.

Griffith, Charles 1900

Griffith, James Arthur 1905

Lancaster.

Frailey, William Otterbein 1903

Heinitsh, Sigmund William 1889

Martin, David G. 1905

Langhorne.

HANCOCK, CHARLES WEST 1868

Lebanon.

LEMBERGER, JOSEPH LYON 1858

Redsecker, Jacob Henry 1881

Lititz.

Moyer, Lewis Nathan 1903

Manheim, Lancaster Co.

Ruhl, Harry Fry 1902

Mars.

Willets, Charles Ellsworth 1905

McKeesport.

West, Walter Lionel 1905

Meadville.

Utech, Philip Henry 1907

Media.

Meeker, George Herbert 1905

Mt. Joy, Lancaster Co.

Garber, Elmer Franklin Weaver. 1901

Mount Pleasant.

Cummings, John A. 1905

Mt. Union.

Harper, Grace Irene 1905

New Castle.

Haley, John B. 1902

Wallace, John Crawford 1905

Norristown.

Reed, Willoughby Henry 1893

Ogontz.

Clayton, Abraham T. 1906

Philadelphia.

Apple, Franklin Muhlenberg	1905	Hughes, Francis Stacker	1902
Baer, Jacob Michael	1902	Hunsberger, Ambrose	1905
BAUER, LOUIS GUSTAVUS	1867	Kahn, Solomon Karl	1905
Bell, Robert Nevens	1905	Kelley, John J.	1905
Blackwood, Russell Thorn	1907	Kercher, Edwin Harry	1907
Bonta, Clarence LaRue	1906	Kirk, Frank Hall	1907
Borell, Henry Augustus	1874	Kirk, Samuel Bird	1907
BORING, EDWARD McCURDY	1867	Kline, Clarence Mahlon	1902
Burg, John Dellinger	1888	Kline, Mahlon Norwood	1878
Burke, William Thompson	1906	Koch, Christopher	1907
Busch, Miers	1903	KRAEMER, HENRY	1892
Cadmus, Robert Clark	1906	Krauss, Otto	1906
Cameron, Charles Sherwood	1906	Lacy, William Henry	1907
Campbell, Milton	1902	Lackey, Richard Henry	1907
Campbell, Theodore	1902	LaWall, Charles Herbert	1896
Carpenter, William A.	1906	LaWall, Millicent Saxon (Mrs.)	1905
Clapham, Hesser Charles	1907	Lawrence, George W.	1906
Cliffe, William Lincoln	1898	Lawrence, Henry Haydock	1907
Cook, Ernest Fullerton	1901	Lee, William Estell	1905
Crawford, Joseph	1903	Leedom, Charles	1902
Cuthbert, Richard Williams	1906	Long, John Nathan Grier	1906
Decker, W. Robert	1907	Lowe, Clement Belton	1895
Eberly, Frank Hertzler	1907	Marsden, Joshua Eugene	1906
Egbert, Seneca	1905	Matusow, Harry	1897
<i>Ellis, Evan Tyson</i>	1857	McConomy, Paul Lucien	1906
England, Joseph Winters	1893	McFerren, Jeremiah Dull	1906
Eppstein, Jacob	1902	McIntyre, William	1868
Evans, George Bryan	1902	McNeil, Robert	1907
Feidt, George David	1898	<i>Mellor, Alfred</i>	1864
Finney, John Joseph	1906	Mentzer, Harvey H.	1902
Flack, Herbert Louis	1905	MILLER, ADOLPHUS WILLIAM	1868
FOX, PETER PAUL	1869	Minehart, John Roy	1905
French, Harry Banks	1890	Moerk, Frank Xavier	1898
French, Howard Barclay	1906	Monaghan, Thomas Francis	1902
Gabell, Cromwell Pearce	1907	MOORE, JOACHIM BRICKLEY	1860
Gano, William Hubbell	1892	Morgan, Frank E.	1906
Graham, Willard	1902	MORRIS, LEMUEL IORWERTH	1880
Greenwalt, William Grant	1907	Mulford, Henry Kendall	1896
Hance, Anthony Miskey	1902	Nebig, William George	1907
HANCE, EDWARD HANCE	1857	Oetinger, Albert	1902
Harbold, Curtis Alexander	1907	Oliver, Frank Murphy	1906
Harbold, John Tilden	1905	Osterlund, Otto William	1902
Hassinger, Samuel Ellphat Reed	1880	Ottinger, James Jeremiah	1876
Hausmann, Frederick William	1895	Pachili, Theodore, Jr.	1907
Haydock, Susannah Garrigues	1905	Peacock, Bertha Leon (Mrs.)	1895
Heim, William Joseph	1902	Peacock, Josiah Comegys	1892
<i>Heintzelman, Joseph Augustus</i>	1858	Pile, Gustavus	1881
High, Raymond Lightcap	1902	Poley, Warren Henry	1906
Hinton, Rufus Guy	1905	Pollard, Augustus Torrey	1906
Hoch, Aquilla	1896	Potts, David Gardner	1893
Hoch, Quintus	1907	Potts, Thomas Humphreys	1906
		Rauff, U. Gilbert	1907

Reese, David John 1906
 Remington, J. Percy 1901
 REMINGTON, JOSEPH PRICE 1867
 Riegel, Samuel Jacob 1905
 Rosengarten, George David 1902
 Sadtler, Samuel Philip 1893
 Shafer, Erwin Clement 1893
 Shoemaker, Clayton French 1902
 SHOEMAKER, RICHARD MARTIN 1865
 Siegfried, Howard J. 1907
 Smith, Albert Henry 1902
 Smith, Walter Valentine 1902
 Stanislaus, Ignatius Valerius Stanley.. 1906
 Staudt, Albert John 1907
 Stewart, Francis Edward.. 1884
 Streep, Frank Park 1907
 Stroup, Freeman Preston 1900
 Swain, Harry 1902
 Thum, John Karl 1905
 Toplis, William George 1905
 Turner, Joseph L. 1906
 Warner, William Richard, Jr. 1902
 WEIDEMANN, CHARLES ALEXANDER.. 1868
 Weidemann, George Buzby 1902
 Wendel, Henry Edward 1873
 White, Robert Charles 1906
 Wiegand, Thomas Snowden 1857
 Wilbert, Martin Inventius 1902
 Wolcott, Abraham Lincoln 1903
 Wood, Horatio C., Jr. 1906

Pittsburg.

Aron, Frank X. 1905
 Bell, William Ray 1906
 Blank, Herman Gustave 1905
 Blumenschein, Frederick John 1904
 Dahlin, Horace Otto 1905
 Darbaker, Lessure Kline 1905
 Emanuel, Louis 1878
 Engelsberg, Paul 1905
 Fawcett, Charles Emerson 1905
 Judd, Albert Floyd 1901
 Koch, Julius Arnold 1892
 McGovern, John Francis 1906
 Moyer, Ray Paul 1907
 Muchnic, Adolph Morris 1905
 Myers, Charles Joseph 1905
 Patterson, Charles Meade 1905
 Ringer, Charles Elmer 1905
 Rodemoyer, William Edward 1901
 Saalbach, Louis 1907
 Schaefer, Emil August 1900

Siegfried, Henry J. 1905
 Smythe, William Raymond 1905
 Soult, Roy Mont 1905
 Thompson, John Reynolds 1905
 Trust, Edward 1905
 Voellger, Ernest Hugo 1905
 Weil, Albert Joseph 1905
 Wiegel, Carl George 1904

Plumville.

Green, James Blaine 1905

Pottsville.

Diebert, Thomas Irwin 1882

Rankin.

Hollander, Joseph Maurice 1905

Reading.

Stein, Jacob Henry 1902
 Ziegler, Howard Philip 1905
 ZIEGLER, PHILIP MILTON 1867

Rochester.

Patterson, Charles Meade 1905

Scranton.

Davis, Emma May 1905
 Davis, George Warren 1905
 Thomas, Daniel Judson 1905

Shenandoah.

Houck, Paul Winters 1905

Swissvale.

Johnson, Ralph Henry 1901

Towanda.

PORTER, HENRY CARROLL 1872

Uniontown.

Clark, Harry Scott 1905

Washington.

McConaughy, Thomas Singleton.... 1905
 Vowell, Louis Sweitzer 1905

Waynesburg.

Hill, Frank Rush 1905

Wilkinsburg.

Hall, Guy P. 1905

Williamsport.

Cornell, Edward Augustus 1873
 Millener, William S. 1905
 Smith, Edward W. 1902
 Walton, Lucius Leedom 1904

Wilmerding.

Young, Harry Garfield1905

York.

Leber, Jacob Gilbert1905

Patton, John Franklin1880

PHILIPPINE ISLANDS.

Cavite.

Schaffer, Charles1903

Cebu.

McBride, Charles Robert1904

Cotabato.

Askew, Alfred Joseph1905

Barton, Willard Mortimer.....1906

Manila.

Comfort, Newton C....1904

Guerrero, Leon Maria.....1904

Hammer, James Faris.....1906

Riess, Herman William1903

Mindanao.

Baigent, John T.....1906

Compton, Paul.....1906

Kauffman, Emmett Clarence1907

Maloney, Patrick Jarlath1905

Pampanga.

Collins, John Lawrence.....1906

Van Sickle, George Campbell1906

Weber, Eugene1906

Zamboanga.

Perry, Clifford Henry1906

RHODE ISLAND.

Naragansett Pier.

Tobin, John Martin.....1887

Newport.

Bristow, Thomas George1904

Downing, Benjamin Franklin, Jr.....1886

Kalkman, Henry Alfred1907

Pearson, Joseph Frederick1897

Wood, John William.....1897

Providence.

Blanding, William Oliver1894

Crawford, Frank Eugene1902

Greene, William Ray.....1883

O'Hare, James1888

Pearce, Howard Anthony.....1894

Strickland, Franklin Nelson.....1905

Westerly.

Collins, Albert Burlingame.....1882

Woonsocket.

Jackson, Frank Anthony1900

Simmons, Frank Birtles.....1897

SOUTH CAROLINA.

Pelzer.

Bramblett, Oscar Eugene1905

SOUTH DAKOTA.

Aberdeen.

Griffis, Orville A.....1906

Woodward, Albert A.....1906

Alexandria.

Baughman, Leo Melzer.....1907

Arlington.

Maxwell, Charles Coleman1906

Burke, Gregory Co.

Fulton, Peter MacMullen.....1901

Collon.

Lowry, George Warren.....1906

Dell Rapids.

Bent, Edward Clarence.....1905

Lake Preston.

Keith, Irwin Alonzo1906

Mitchell.

Scallin, Stephen H.....1906

Sioux Falls.

Dunning, Lyman Taylor.....1906

Watertown.

Jones, David Franklin.....1895

Yankton.

Brecht, Frederick Adolph.....1895

Walhann, Carl G.....1907

TENNESSEE.

Bristol.

Brashear, Owen Lee1906

Chattanooga.

Voigt, Joseph Frederick1893

Knoxville.

Rosenthal, David Abraham1894

Memphis.

ROBINSON, JAMES SCOTT1869

Sheehan, John S.1907

Nashville.

Holt, Lewis Herbert, Jr.1907

Justice, J. Edwin1906

McGill, John Thomas1900

Ruddiman, Edsel Alexander1894

White, William Rufus1904

Sewanee.

Leiper, James Armstrong, Jr.1904

Sharon.

Shannon, Thomas J.1905

TEXAS.

Ballinger.

Hunter, Angus1906

Brownsville.

Willman, William George1904

Corsicana.

Coulson, James Thomas1906

Dallas.

Chisholm, Jesse Connor1906

Cormick, John W.1906

Crawford, Claude Marcelle... ..1906

De Lorenzi, Albert1890

Duncan, Chester Arthur1906

Eberle, Eugene Gustavus1896

Golaz, Ernest Henry.... ..1907

Groner, William Christopher, Jr.1905

Schrodt, Jacob1903

Treadwell, William Pickens1906

Denton.

Allison, Samuel Porter1905

Detroit.

McGee, George1907

El Paso.

Ryan, Ambrose Eugene1907

Weaver, John Alvin1906

Fort Worth.

Needham, Robert Hamilton1906

Whitsitt, Lee Melford1905

Galveston.

Buckner, John Clark1905

Cline, Raoul René Daniel.1898

Orton, Ingomar François1891

Goldthwaite.

Oxford, Albert1904

Gonzales.

Robertson, William Franklin1907

Walker, Robert Hamilton1907

Hallettsville.

Saccar, Michael1905

Houston.

Burgheim, Jacob1892

Hughes Springs.

Class, William Finis1904

Paris.

Musselman, Claude J.1906

Saint Jo.

Pedigo, Smith C.1907

Stamford.

Cooper, Oscar Hamilton1904

Miller, Mark Elias1905

Taylor.

Thames, Joseph Jefferson1895

Troupe.

McKay, Felix Early1903

Velasco.

Roeller, Edward Frank1902

Waxler, Gonzales Co.

Brookes, Virginia Cade1901

UTAH.

Salt Lake City.

Coffman, Walter Thomas1904

Smithfield.

Colpin, Emanuel Edward1907

VERMONT.

Barre.

Davis, Daniel Frost 1907

Burlington.

Zottman, William Henry 1903

Marshallfield.

Gilman, Elbridge Wheeler 1907

Montpelier.

Blakely, Collins 1899

Slade, Henry Allen 1899

Terrill, Willis Ethel 1899

Morrisville.

Cheney, Arthur Lewis 1907

Newport.

Bigelow, Charles Frederick 1907

Proctor.

Skeels, Howard Morton 1907

St. Johnsbury.

Bingham, Charles Calvin 1875

VIRGINIA.

Barton Heights.

Miller, Rosbier W. 1906

Berkley.

Alexander, David John K. 1907

Charlotte C. H.

Williams, Walter Gregory 1905

Culpeper.

Goldsborough, Charles Henry 1898

Harrisonburg.

Avis, James Little 1905

Newport News.

Klor, Alexander Edward George 1899

Norfolk.

Martin, William Rogers 1905

Nelligar, Frederick Dennis 1907

Scott, Edgar Burroughs 1905

Phoebus.

Congdon, George Gardner 1903

Richmond.

Brandis, Ernest Linwood 1906

Briggs, Andrew Gessner 1890

Curd, Thomas Nelson 1907

Harrison, Robert Lucius 1900

Miller, Turner Ashby 1894

Scott, William Henry 1873

Roaooke.

Barnes, Henry Cooper 1905

Suffolk.

Hall, Joseph Patten 1900

WASHINGTON.

Fort Ward.

England, Thomas M. 1905

La Conner, Skagit Co.

Joergensen, Gerhard Johan Carl Sophus. 1889

Port Townsend.

Kliemad, George 1907

Pullman.

Schneider, Benjamin 1907

Watt, George Henry 1896

Puyallup.

Truedson, Eric Per 1904

Seattle.

Aschermann, Gustav Singer 1905

Holmes, Henry Elliott 1880

Johnson, Charles Willis 1903

Lough, Thomas Warner 1905

Osseward, Cornelius 1897

Watson, Joseph Ryerson 1904

Snohomish.

Wilbur, Lot 1896

Spokane.

Bradley, Linn 1904

McArthur, James W. 1904

Tacoma.

Gamer, Albert Charles C. 1902

Walker, Charles Henry 1904

Walla Walla.

Tallman, Lewis Lifferty 1904

Wilbur.

Bandy, George 1905

WEST VIRGINIA.

<i>Bluefield.</i>	
Crouch, William Tazewell	1906
<i>Buckhannon.</i>	
Young, George Orvill.....	1907
<i>Cameron.</i>	
Hill, William Gibson Clark	1905
<i>Clarksburg.</i>	
Haymaker, Frank Berkshire ..	1906
<i>Colliers.</i>	
Robinson, Henry Sherman	1905
<i>Farmington.</i>	
Moran, William Patrick	1905
<i>Harper's Ferry.</i>	
Dittmeyer, Walter Eugene	1907
<i>Littleton.</i>	
Carney, Frank ...	1905
<i>Moundsville.</i>	
Gray, Will Wesley.....	1905
<i>New Martinsville.</i>	
Keyser, George Francis	1905
<i>Parkersburg.</i>	
Brown, Edward Preston	1906
<i>Philippi.</i>	
Mason, Wm. Lindsey	1905
<i>Pine Grove.</i>	
Morgan, Thomas Lee	1907
<i>Sutton.</i>	
Walker, Alfred.....	1905
<i>Wheeling.</i>	
Coleman, John.....	1905
Dawson, Edward Bruce	1907
Gordon, William C.....	1905

WISCONSIN.

<i>Antigo.</i>	
Gauthier, Charles Desiro.....	1906
<i>Cumberland.</i>	
Arneson, Thomas	1906
<i>Eau Claire.</i>	
Boberg, Otto Johan Sinius.....	1903
<i>La Crosse.</i>	
Beyschlag, Charles.....	1880
Hebbard, Edward Smith	1907
<i>Madison.</i>	
Fischer, Richard	1901
Kremers, Edward.....	1887
Schulz, Raymond.....	1907
Williams, Edward	1906
<i>Milwaukee.</i>	
Brundage, Albert Harrison.....	1892
Dadd, Robert Morrow	1896
DRAKE, JOHN RANSOM	1860
Janssen, Jacob Solomon	1903
Kettler, Edward, Jr.	1896
Krembs, Ernest Maximilian	1903
Raeuber, Edward Gottfried	1900
Ruenzel, Henry Gottlieb.....	1892
Schrank, Charles Henry	1876
Spiegel, Adolph.....	1905
<i>Neillsville.</i>	
Sniteman, Charles Clarence	1881
<i>Uconomowoc.</i>	
Peters, Henry August	1903
<i>Racine.</i>	
Horlick, Alexander James	1904
<i>Watertown.</i>	
Eberle, Arthur Ralph	1907
Eberle, Herman Theodore.....	1901

DOMINION OF CANADA.

MANITOBA.

<i>Winnipeg.</i>	
Bletcher, Henry Ernest John.....	1904
<i>NEW BRUNSWICK.</i>	
<i>St. John.</i>	
Paddock, Morris Venner	1902

ONTARIO.

<i>Guelph.</i>	
Stewart, Alexander ...	1905
<i>Ottawa.</i>	
SAUNDERS, WILLIAM.....	1860

<i>Stratford.</i>	QUEBEC.
	<i>Montreal.</i>
WAUGH, GEORGE JAMES .....1862	Lachance, Seraphin.....1888
	Morrison, Joseph Edward.....1888
<i>Toronto.</i>	<i>Quebec.</i>
Hargreaves, John.....1904	Willis, Henry .....1897
Heebner, Charles Frederick .....1894	<i>Three Rivers.</i>
Simson, Francis Cook .....1876	Williams, Richard Wellington.....1883

MEMBERS RESIDING IN FOREIGN COUNTRIES (*except Canada*).

Abreu, Gerardo Fernandez, Havana, Cuba.....	1907
Alacin, José P., Havana, Cuba.....	1907
Bernström, Nils Gustaf, Stockholm, Sweden.....	1906
Carpote, Jos ^e , Havana, Cuba.....	1907
Cartaya, Julio Hernandez, Havana, Cuba.....	1907
Curquejo, Antonio Gonzales, Havana, Cuba.....	1907
Diaz, Jos ^e : Guillermo, Havana, Cuba.....	1907
Estenoz, Francisco Ramirez, Havana, Cuba.....	1907
Fanous, Amin, Fayoum, Egypt.....	1907
Hallaway, Robert Railton, Carlisle, England.....	1905
Heyl, James Bell, Hamilton, Bermuda.....	1863
Johnson, Manuel, Havana, Cuba.....	1907
Ladakis, Triantaphylo, Beirút, Syria.....	1907
Martin, Nicholas Henry, Gateshead-on-Tyne, England.....	1891
Martinez, Alfred, Havana, Cuba.....	1907
McLarty, Colin, Yokohama, Japan.....	1898
Morales, Celestino Garcia, Havana, Cuba.....	1907
Moya, Carlos A., Havana, Cuba.....	1907
Murray, Alexander, San José de Costa Rica.....	1903
Neil, John Gerrie, Dunedin, New Zealand.....	1905
Patch, James Alfred, Beirút, Syria.....	1903
Pirie, Alfred Mitchell, Cartago, Costa Rica.....	1903
POWER, FREDERICK BELDING, London, England.....	1872
WELLCOME, HENRY SOLOMON, London, England.....	1875

MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Burdsal, Albert Howard.....	1904
Fly, Anthony.....	1905
Lippy, George Henry.....	1906
Lord, Frederic W.....	1905
McAteer, James William.....	1905
Metcalf, Alexander Hamilton.....	1905
Noaks, Richard Sidney.....	1905
Reid, William Watts.....	1905
Sheridan, William Franklin.....	1904
Smith, Joseph Homer.....	1905
Whittier, James.....	1905

NOTE.—Names of life members whose residence has been unknown for five consecutive years, are no longer published in the above list, in accordance with the action of the Council approved at the forty-eighth annual meeting. (See Proceedings, 1900, p. 18.)

ALPHABETICAL LIST OF MEMBERS.

HONORARY MEMBERS.

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Hooper, David, F. I. C., F. C. S., Indian Museum, 1 Sudder St., Calcutta, India.

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Schaer, Dr. Edward, Professor of Pharmacy, Pharmaceutisches Institut der Universität, Strassburg, Germany.

Schmidt, Professor Dr. Ernst, Geh. Regierungsrath, Marburg, Germany.

(1019)

ACTIVE MEMBERS.

Members are requested to notify the General Secretary of errors or inaccuracies in the following list. The Association will not replace volumes of Proceedings lost through changes of residence of which the General Secretary has not been notified. See Proceedings, 1866, p. 66.

- | | |
|--|---|
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DeSiard st., Monroe, La. |
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22 Brinkerhoff, st., Jersey City, N. J. | Allen, William H.
208 Harper ave., Detroit, Mich. |
| Abreu, Gerardo F.;
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Denton, Tex. |
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100 William st., New York, N. Y. |
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Hines Block, Cumberland, Wis. |

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Asher, Philip,	725 Camp st., New Orleans, La.	Ballagh, Wilfred T.,	S. E. cor. Square, Nevada, Mo.
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Avery, Charles H.,	302 E. 55th st., Chicago, Ill.	Baltzly, Albert B.,	2278 7th ave., New York, N. Y.
Averyt, Henry M.,	426 Baldwin ave., Detroit, Mich.	Baltzly, Zachariah T.,	Massillon, O.
Avis, James L.,	83 S. Main st., Harrisonburg, Va.	Bancroft, Richard B.,	310 Central ave., Hot Springs, Ark.
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Ayres, Albert J.,	718 Broadway, Hannibal, Mo.	Bange, Otto F.,	cor. 11th & German sts., Newport, Ky.
Ayres, Gold,	England, Ark.	Banks, Walter C.,	1900 S. Main st., Los Angeles, Cal.
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Bachelle, Percy von,	100 State st., Chicago, Ill.	Barnard, Harry A.,	171 Main st., Marlboro, Mass.
Bachelle, Rudolph von,	130 E. 43d st., Chicago, Ill.	Barnes, Henry C.,	2 S. Jefferson st., Roanoke, Va.
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- Baur, Jacob,
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Scio, O.
- Beal, James H.,
Scio, O.
- Bear, Pierce B.,
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- Bechberger, Henry,
535 Kinsman st., Cleveland, O.
- Beck, Julius E.,
Honolulu, H. I.
- Beckenbach, Edward,
223 Superior st., Cleveland, O.
- Becker, Charles L.,
304 S. Main st., Ottawa, Kan.
- Becker, Irwin A.,
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- Becker, Ulrich W.,
232 Bay st., Stapleton, N. Y.
- Behrens, Emil C. L.,
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- Bell, Wm. Ray,
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- Beringer, George M., Jr.,
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- Berner, Carl A.,
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- Best, John,
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- Best, Samuel M.,
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- Bethea, Oscar W.,
cor. 4th st. & 22d ave., Meridian, Miss.
- Betzler, Jacob,
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- Bevens, J. L.,
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- Bigelow, Charles F.,
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- Bigelow, Clarence O.,
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- Biggs, Warren H.,
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- BILLINGS, HENRY M.,
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- Bingham, Charles C.,
37 Main st., St. Johnsbury, Vt.
- BIROTH, HENRY,
965 E. 37th st., Chicago, Ill.
- Blackmore, Henry S.,
612 F st. N. W., Washington, D. C.
- Blackwood, Russell T.,
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- Blahnik, Karel B.,
1835 W. 47th st., Chicago, Ill.
- Blahnik, Marie (Mrs.),
88 W. 18th st., Chicago, Ill.
- Blahnik, Vencel L.,
1835 W. 47th st., Chicago, Ill.

- Blaikie, William,
 202 Genesee st., Utica, N. Y.
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 175 2d st., The Dalles, Ore.
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 Blakeslee, Louis G.,
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 422 Notre Dame ave., Winnipeg, Manitoba.
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 426 Baldwin ave., Detroit, Mich.
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 Bristow, Thos. G.,
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- Brunn, Harold N.,
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 Bryson, William S.,
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 Bucknam, Frank W.,
 Skowhegan, Me.
 Buckner, John C.,
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- Clough, Frank H.,
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- Cobb, Ralph L.,
112 Superior st., Cleveland, O.
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- Davis, Charles L.*,
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- Davis, Daniel F.*,
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- Griffith, Chas.,
306 Main st., Johnstown, Pa.
- Griffith, James A.,
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- Gross, William O.,
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37 Nueva st., Ermita, Manila, P. I.
- Guidry, Ambrose J.,
133 N. Genois st., New Orleans, La.
- Gundrum, George,
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- Haake, William H.,
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- Hackenberger, George W.,
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- Haddad, Saleem F.,
89 Broad st., New York, N. Y.
- Haeger, Fred.,
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- Haeseler, Frank P.,
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 22 Cliff st., New York, N. Y.
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13 W. Montgomery st., Baltimore, Md.
- Stier, George F.,
cor. Ludlow st. & Clinton ave., Cincinnati, O.
- Stimson, Charlotte E. (Miss),
Tiskilwa, Ill.
- Stoddart, Thomas,
84 Seneca st., Buffalo, N. Y.
- Stolle, Henry J.,
4th & Market sts., St. Louis, Mo.
- Stoltz, Otto G.,
60 Rush st., Chicago, Ill.
- Stone, Clarence G.,
273 Rich ave., Mt. Vernon, N. Y.
- Storer, Charles A.,
cor. Rush & Ohio sts., Chicago, Ill.
- Stott, Samuel T.,
505 Penna. ave. N. W., Washington, D. C.

- Stoughton, Dwight G.,
 204 State st., Hartford, Conn.
 Stout, Marion A.,
 Bluffton, Ind.
 Stowe, Ernest A.,
 100 N. Prospect st., Grand Rapids, Mich.
 Streep, Frank P.,
 Chestnut Hill, Philadelphia, Pa.
 Strickland, Franklin N.,
 4 Market Square, Providence, R. I.
 Stringer, Orum H.,
 Hopedale, O.
 Stroup, Freeman P.,
 145 N. 10th st., Philadelphia, Pa.
 Stuchlik, John,
 338 W. 18th st., Chicago, Ill.
 Sturmer, Julius W.,
 107 Fowler ave., Lafayette, Ind.
 Stutzlen, Frank C.,
 231 3d st., Elizabeth, N. J.
 Sultan, Frederick W.,
 4615 Maryland ave., St. Louis, Mo.
 Sum, Francis,
 2840 Clark ave., St. Louis, Mo.
 Suppan, Leo R. A.,
 2648 Russell ave., St. Louis, Mo.
 Swain, Harry,
 13th & Lombard sts., Philadelphia, Pa.
 Swann, Samuel V. B.,
 918 6th ave., New York, N. Y.
 Swaringen, DeWitt C.,
 China Grove, N. C.
 Sweet, Caldwell,
 22 W. Market Square, Bangor, Me.
 Sweet, William H.,
 1731 Chicago ave., Minneapolis, Minn.
 Symonds, Arthur H.,
 Conneaut, Ashtabula Co., O.
 Takamine, Jokichi,
 521 W. 179th st., New York, N. Y.
 Tallman, Lewis L.,
 2d & Main sts., Walla Walla, Wash.
 Taylor, Augustus C.,
 201 Maryland av. N. E., Washington, D. C.
 Taylor, George E.,
 Pueblo, Colo.
 Taylor, Henry L.,
 2 Woodlawn Ave., Albany, N. Y.
 Taylor, Walter T.,
 501 N. Main st., Los Angeles, Cal.
 Teeters, William J.,
 Iowa Coll. Pharm., Iowa City, Ia.
 Temm, William D.,
 1926 N. Grand ave., St. Louis, Mo.
 Tepe, Louis,
 229 E. Columbia st., Evansville, Ind.
 Terrill, Willis E.,
 9 State st., Montpelier, Vt.
 Thames, Joseph J.,
 E. Main st., Taylor, Williamson Co., Tex.
 Thelander, Creston C.,
 921 4th st., Sioux City, Ia.
 Thomas, Daniel J.,
 345 Wyoming ave., Scranton, Pa.
 Thomas, John B.,
 Baltimore & Light sts., Baltimore, Md.
 Thomas, Oscar B.,
 101 E. Baltimore st., Baltimore, Md.
 Thomas, Robert, Jr.,
 108 Broad st., Thomasville, Ga.
 Thompson, Albert D.,
 1st ave. S. and 3d st., Minneapolis, Minn.
 Thompson, Edwin T.,
 911 W. 7th st., Sioux City, Ia.
 Thompson, John R.,
 315 Smithfield st., Pittsburgh, Pa.
 Thompson, Leon A.,
 278 Dartmouth st., Boston, Mass.
 Thorburn, Albert D.,
 111-117 N. Capitol av., Indianapolis, Ind.
 Thorn, Henry P.,
 Main st., Medford, N. J.
 Thum, John K.,
 1531 N. Opal st., Philadelphia, Pa.
 THURSTON, AZOR,
 Grand Rapids, Wood Co., O.
 Thurston, Edwin J.,
 Mobile Quarantine, Ft. Morgan, Ala.
 Tielke, Maxwell G.,
 474 Detroit st., Cleveland, O.
 Tilton, Claude E.,
 Fairmount, Ill.
 Timberlake, Arthur,
 College ave. & 16th st., Indianapolis, Ind.
 Timmer, Jacob B.,
 181 Lake ave., Grand Rapids, Mich.
 Timmons, George D.,
 458 Greenwich st., Valparaiso, Ind.
 Tobin, John M.,
 Narragansett Pier, R. I.
 Todd, Albert M.,
 204 N. Rose st., Kalamazoo, Mich.
 Toplis, William G.,
 4939 Germantown ave., Philadelphia, Pa.

- Topping, Arthur E.,
Overbrook, Kan.
- Torbert, Willard H.,
756 Main st., Dubuque, Ia.
- Toulson, Milbourne A.,
Chestertown, Md.
- Traynor, Charles F.,
159 Maine st., Biddeford, Me.
- Treadwell, William P.,
568 Elm st., Dallas, Tex.
- Treat, Joseph A.,
Stuart, Guthrie Co., Ia.
- Treber, Frederick W.,
301 W. Broadway, Louisville, Ky.
- Tripp, Arthur H.,
573 Talbot ave., Dorchester Center, Mass.
- Trout, John H.,
328 S. Broadway, Los Angeles, Cal.
- Troxler, Constantine, Jr.,
228 W. Breckenridge st., Louisville, Ky.
- Troxler, Robert F.,
3 B. st., S. E., Washington, D. C.
- Truax, Charles,
42 Wabash ave., Chicago, Ill.
- True, Rodney H.,
224 12th st. S. W., Washington, D. C.
- Truedson, Eric P.,
Puyallup, Wash.
- Trust, Edward,
1221 5th ave., Pittsburg, Pa.
- Tucker, Greenleaf R.,
City Hospital, Boston, Mass.
- Turner, Joseph L.,
416 S. 15th st., Philadelphia, Pa.
- Tuthill, Frederick P.,
526 Putnam ave., Brooklyn, N. Y.
- Tuttle, George O.,
387 Congress st., Portland, Me.
- Uhlich, Ferdinand G.,
2001 Salisbury st., St. Louis, Mo.
- Utech, P. Henry,
209 Chestnut st., Meadville, Pa.
- Valentine, William G.,
3900 Cottage Grove ave., Chicago, Ill.
- van Aller, Thomas S.,
210 S. Broad st., Mobile, Ala.
- Van Antwerp, James G.,
250 State st., Mobile, Ala.
- Van Derveer, Robert H.,
Broad & Monmouth sts., Red Bank, N. J.
- Van Ness, George I.,
U. S. P. H. & M. H. S., Ft. Stanton, N. Mex.
- Van Schaack, Cornelius P.,
138 Lake st., Chicago, Ill.
- Van Sickle, George C.,
Camp Stutsenburg, Pampanga, P. I.
- Vanderkleed, Charles E.,
200 First ave., Collingswood, N. J.
- Vargas, Jorge,
809 Beacon st., Boston, Mass.
- Varney, Edward F.,
554 37th st., Oakland, Cal.
- Vaughan, Parry W.,
106 E. Main st., Durham, Orange Co., N. C.
- Vaughn, Patrick H.,
304 Central ave., Hot Springs, Ark.
- Vause, H. Russel,
47th st. & Cottage Grove ave., Chicago, Ill.
- Veaco, Sidney H.,
East Chicago, Ind.
- Vernor, James,
33 Woodward ave., Detroit, Mich.
- Villere, Rene L.,
1001 Esplanade ave., New Orleans, La.
- Vincent, Fred. A. C.,
Room 5, Ricksecker Bldg., Kansas City, Mo.
- Voegeli, Thomas,
Hennepin & Wash. sts., Minneapolis, Minn.
- Voellger, Ernest H.,
733 Summerlea st., E. Pittsburg, Pa.
- Voigt, Joseph F.,
840 Market st., Chattanooga, Tenn.
- VOISS, ARCADIOUS,
395 Wells st., Chicago, Ill.
- Von Stein, John H.,
Upper Sandusky, O.
- Voorhees, Harry B.,
901 Washington st., Easton, Pa.
- VORDICK, AUGUST H.,
Jefferson ave. & Benton st., St. Louis, Mo.
- Voss, Edward Jr.,
1201 Vine st., Cincinnati, O.
- Voss, George W.,
680 Woodland ave., Cleveland, O.
- Votteler, William,
Shelby & Oak sts., Louisville, Ky.
- Vowell, Louis S.,
62 S. Main st., Washington, Pa.
- Waddell, Minor T.,
1207 Ash st., Indianapolis, Ind.
- Wade, Guy L.,
28 South Roane ave., Webb City, Mo.
- Wagner, Arthur C.,
231 Belmont ave., Everett, Mass.

- Walbrach, Arthur,
1200 15th st., Denver, Colo.
- Walbridge, Cyrus P.,
620 Washington ave., St. Louis, Mo.
- Waldner, Paul J.,
U. S. Naval Laboratory, Brooklyn, N. Y.
- Walker, Alfred,
Sutton, W. Va.
- Walker, Chas. H.,
115 South G st., Tacoma, Wash.
- Walker, Robert H.,
Gonzales, Tex.
- Walker, William A.,
127 West Georgia st., Indianapolis, Ind.
- Wall, Otto A.,
4532 Virginia ave., St. Louis, Mo.
- Wallace, John C.,
61 E. Washington st., New Castle, Pa.
- Wallhann, Carl G.,
101 W. Third st., Yankton, S. D.
- Walsdorf, Chas. A.,
Carrollton ave. & Oak st., New Orleans, La.
- Walsdorf, Edw. H.,
Peters ave. & Magazine st., New Orleans, La.
- Walter, Charles A.,
1576 Jackson Blv'd, Chicago, Ill.
- Walter, Peter G.,
cor. Chestnut & Liberty sts., Allegheny Pa.
- Walton, Lucius L.,
50 W. Fourth st., Williamsport, Pa.
- Walz, J. Lee,
743 Dolphin st., Baltimore, Md.
- Wangler, Conrad D.,
227 E. 4th st., Waterloo, Ia.
- Wanous, Josie A., (Miss).
720 Nicollet ave., Minneapolis, Minn.
- Ward, A. Jae,
107 E. Pike's Peak av., Colorado Spr'gs, Colo.
- Ward, Enoch J.,
Front st., Ellisville, Miss.
- Ward, Homer B.,
Rowland, N. C.
- Ware, Charles H.,
1930 Madison ave., Baltimore, Md.
- Ware, Clarence W.,
Leon, Ia.
- Warfield, James A.,
Washington, O.
- Warn, William E.,
Lock Box 342, Keyport, N. J.
- Warner, Francis D.,
137 E. Michigan st, New Carlisle, Ind.
- Warner, Louis H.,
473 Franklin ave., Brooklyn, N. Y.
- Warner, William R., Jr.,
639 N. Broad st., Philadelphia, Pa.
- Warren, Lee,
2703 Montana ave., Eillings, Mont.
- Warren, Robert A.,
Clarksville, Ark.
- Washburn, Homer C.,
Norman, Okla.
- Wassmann, Louis W.,
600 E. Ormsby st., Louisville, Ky.
- Watkins, Charles W.,
227 S. Illinois st., Indianapolis, Ind.
- Watson, Herbert K.,
803 Market st., Wilmington, Del.
- Watson, Joseph R.,
330 18th ave. N., Seattle, Wash.
- Watson, William, Jr.,
202 Genesee st., Utica, N. Y.
- Watt, George H.,
Pullman, Wash.
- WAUGH, GEORGE J.,
Ontario st., Stratford, Ont., Can.
- Weaber, John A.,
209 S. El Paso st., El Paso, Tex.
- Webb, Edward N.,
277 E. 14th ave., Columbus, O.
- Webber, Arthur H.,
Cadillac, Mich.
- Webber, J. Le Roy,
277 Greene ave., Brooklyn, N. Y.
- Weber, Eugene,
Camp Stotsenburg, Pampanga, P. I.
- Weed, Nelson,
411 S. Front st., Mankato, Minn.
- Weicker, Theodore,
78-80 Beekman st., New York, N. Y.
- WEIDEMANN, CHARLES A.,
2148 Green st., Philadelphia, Pa.
- Weidemann, George B.,
2148 Green st., Philadelphia, Pa.
- Weil, Albert J.,
57-8 Bartlett st., Pittsburg, Pa.
- Weilbaeher, Frank E.,
6056 Hurst st., New Orleans, La.
- Weimar, Henry,
122 Central ave., Hot Springs, Ark.
- Weinstein, Abraham,
6,6 Union ave., New York, N. Y.
- Weinstein, Joseph,
75 East Broadway, New York, N. Y.

- Weiser, Wm. A.,
127 E. Jefferson st., South Bend, Ind.
- Weiser, William P.,
501 Market st., Camden, N. J.
- Weiss, Conrad H.,
25 Monroe st., Anacostia, D. C.
- Weiss, Emil O.,
794 6th ave., New York, N. Y.
- WELLCOME, HENRY S.,
Snow Hill Buildings, London E. C., Eng.
- Weller, Frank P.,
755 8th st. S. E., Washington, D. C.
- Wendel, H. Edward,
3d & George sts., Philadelphia, Pa.
- Wendt, William C.,
366 S. 4th st., Columbus, O.
- WENZEL, WILLIAM T.,
1998 Ocean Bl'vd, San Francisco, Cal.
- Werckshagen, Otto,
258 W. Biddle st., Baltimore, Md.
- Werner, Rudolf C.,
2592 Atlantic ave., Brooklyn, N. Y.
- Wescott, William C.,
Pacific & Delaware avs., Atlantic City, N. J.
- Wesner, Henry C.,
Windsor, Henry Co., Mo.
- West, Charles A.,
14 Fulton st., Boston, Mass.
- West, Fred,
c.o. Dr. Hogan, 520 Sacramento st, Vallejo, Cal.
- West, Walter L.,
709 Walnut st., McKeesport, Pa.
- Westcott, James W.,
423 N. Charles st., Baltimore, Md.
- Wetterstroem, Theodore D.,
3935 Spring Grove ave., Cincinnati, O.
- Weydell, K. Albus,
6501 Cottage Grove ave., Chicago, Ill.
- Wheatcroft, John C.,
Grayville, Ill.
- Wheeler, A. Alton,
270 Woodward ave., Detroit, Mich.
- Wheeler, Carlton B.,
18 Main st., Hudson, Mass.
- Wheeler, William D.,
21 Massachusetts ave., Boston, Mass.
- WHELPLEY, HENRY M.,
2342 Albion Place, St. Louis, Mo.
- Whilden, Charles B.,
925 Golden Gate av., San Francisco, Cal.
- Whipple, George H.,
Broad & Fayette sts., Bridgeton, N. J.
- Whitcomb, Frederick E.,
Washington & Garrison avs., St. Louis, Mo.
- White, Albert J.,
Dalton, O.
- White, Charles H.,
153 E. 51st st, New York, N. Y.
- White, Robert C.,
412 S. 13th st., Philadelphia, Pa.
- White, Robin H.,
70 Main st., Mt. Sterling, Ky.
- White, Wm. R.,
314 Hancock st., Nashville, Tenn.
- Whitehead, Eugene T.,
Main st., Scotland Neck, N. C.
- WHITFIELD, THOMAS,
240 Wabash ave., Chicago, Ill.
- Whitney, David V.,
3722 E. 12th st., Kansas City, Mo.
- Whitsitt, Lee M.,
415 Kentucky ave., Fort Worth, Tex.
- Whittet, James,
Residence unknown.
- WICKHAM, WILLIAM H.,
91 Fulton st., New York, N. Y.
- Wicks, Otto,
1375 Myrtle ave., Brooklyn, N. Y.
- Wiegand, Thomas S.,
145 N. 10th st., Philadelphia, Pa.
- Wiegel, Carl G.,
1806 Carson st., Pittsburg, Pa.
- Wikle, Jesse L.,
1010 Noble st., Anniston, Ala.
- WILBERT, MARTIN I.,
2811 Diamond st., Philadelphia, Pa.
- Wilbur, I. ot,
Ave. C & 1st st., Snohomish, Wash.
- Wilcox, Levi,
22 Mitchell ave., Waterbury, Conn.
- Wiley, Harvey W.,
Dept. of Agriculture, Washington, D. C.
- Wilkes, George R.,
500 Main st., Little Rock, Ark.
- Willard, Rowland,
131 E. Main st., Haddonfield, N. J.
- Willenbrink, Chas. A.,
512 Pike st., Covington, Ky.
- Willetts, Charles E.,
Grand ave., Mars, Pa.
- Williams, Edward,
1 West Main st., Madison, Wis.
- Williams, George G.,
P. O. Box 3551, Boston, Mass.

- Williams, John K.,
 391 Main st., Hartford, Conn.
 Williams, Richard W.,
 Notre Dame st., Three Rivers, Que., Can.
 Williams, Seward W.,
 8 Brighton ave., East Orange, N. J.
 Williams, Walter G.,
 Charlotte C. H., Va.
 Williamson, Lee,
 330 W. Baltimore st., Baltimore, Md.
 Willis, Henry,
 4 St. John st., Quebec, Can.
 Willman, Wm. G.,
 Adams st., Brownsville, Tex.
 Willson, George A.,
 106 Branch st., Lowell, Mass.
 Wilser, Joseph M. S.,
 608 Front st., Fargo, N. Dak.
 WILSON, BENJAMIN O.,
 46 Canal st., Boston, Mass.
 Wilson, Charles F.,
 902 N. Main st., Rushville, Ind.
 Wilson, Frederick H.,
 82 Main st., Brunswick, Me.
 Wilson, George B.,
 833 W. 6th st., Los Angeles, Cal.
 Wilson, George T.,
 Bowling Green, Ky.
 Wilson, William H.,
 781 Park ave., New York, N. Y.
 Wimmer, Curt P.,
 115 W. 68th st., New York, N. Y.
 Winberg, Washington W.,
 5100 Lake ave., Chicago, Ill.
 WINKELMANN, JOHN H.,
 118 W. Lombard st., Baltimore, Md.
 Winter, Jas. H.,
 1375 Valencia st., San Francisco, Cal.
 WINTER, JONAS,
 202 Prospect st., Hagerstown, Md.
 Wirth, Adam,
 618 St. Charles st., New Orleans, La.
 Wirthman, J. George,
 1535 Grand ave., Kansas City, Mo.
 Wirthman, Joseph C.,
 18th st. & Troost ave., Kansas City, Mo.
 Wisdom, Hugh,
 426 State st., Chicago, Ill.
 Wittich, Matthew H.,
 1519 E. Franklin ave., Minneapolis, Minn.
 Witting, Frederick F.,
 Longmont, Colo.
- Wittmer, Joseph W.,
 1347 Clay st., Dubuque, Ia.
 Wolcott, A. Lincoln,
 514 Arch st., Philadelphia, Pa.
 Wolf, Charles A.,
 cor. Broadway & Bank sts., Baltimore, Md.
 Wolf, Frank C.,
 324 S. Los Angeles st., Los Angeles, Cal.
 Wolf, J. Carlton,
 2207 E. Pratt st., Baltimore, Md.
 Wolf, Michael F.,
 Eastern ave. & Chester st., Baltimore, Md.
 Wolff, Edward H.,
 522 Washington ave., St. Louis, Mo.
 Wolff, Gustave,
 246 E. 68th st., New York, N. Y.
 WOLTERS DORF, LOUIS,
 171 Blue Island ave., Chicago, Ill.
 Wood, Alonzo F., Jr.,
 2 Church st., New Haven, Conn.
 Wood, Horatio C., Jr.,
 3942 Walnut st., Philadelphia, Pa.
 Wood, James P.,
 2 Church st., New Haven, Conn.
 Wood, John W.,
 494 Broadway, Newport, R. I.
 Woodman, Walter I.,
 St. Augustine, Fla.
 Woodruff, Roderick S.,
 92 Prospect st., Waterbury, Conn.
 Woodward, Albert A.,
 Aberdeen, S. Dak.
 Woodworth, Benjamin S.,
 1002 W. Wayne st., Fort Wayne, Ind.
 Woodworth, Charles B.,
 254 W. Wayne st., Fort Wayne, Ind.
 Wooten, Thomas V.,
 79 Dearborn st., Chicago, Ill.
 Wooyenaka, Keizo,
 521 W. 179th st., New York, N. Y.
 Wrensch, Henry E., Jr.,
 610 Bloomfield ave., Montclair, N. J.
 Wright, Charles L.,
 Allen & Dougherty sts., Webb City, Mo.
 Wuensch, Charles,
 494 Springfield ave., Newark, N. J.
 Wulling, Frederick J.,
 Minn. University, Minneapolis, Minn.
 Wulzen, Dietrich H.,
 400 Castro st., San Francisco, Cal.
 Wunderlich, Edward,
 1415 Dryades st., New Orleans, La.

Wyckoff, Elmer E., 238 E. 5th st., Brooklyn, N. Y.	ZIEGLER, PHILIP M., 526 Penn st., Reading, Pa.
Yeomans, Sidney C., 3360 State st., Chicago, Ill.	ZOELLER, EDWARD V., Main st., Tarboro, N. C.
YORSTON, MATTHEW M., 1063 Central ave., Cincinnati, O.	Zorn, Emil, 12th & Elm sts, Cincinnati, O.
Young, George O., Buckhannon, W. Va.	Zottman, William H., 1 Church st., Burlington, Vt.
Young, Harry G., 346 Marguerite ave., Wilmerding, Pa.	Zuber, A. F., 5108 Wentworth ave., Chicago, Ill.
Zabaldano, Alexander, 1201 Stockton st., San Francisco, Cal.	Zuenkeler, J. Ferd., 1902 Vine st., Cincinnati, O.
Zamentowsky, David, 1423 Michigan ave., Chicago, Ill.	Zurawski, Narcyz J., 4800 Loomis st., Chicago, Ill.
Zeamer, Henry W., 240 Locust st., Columbia, Pa.	Zwick, Albert O., 19 W. 7th st., Cincinnati, O.
Zelinski, Walter F. von, 438 W. Madison st., Chicago, Ill.	Zwick, Karl G., 1102 Madison ave., Covington, Ky.
Ziegler, Howard P., 201 Windsor st., Reading, Pa.	

LIST OF MEMBERS WHO HAVE RESIGNED SINCE PUBLICATION OF
LAST REPORT.

	Residence.	Elected.
Amend, Bernard G.,	New York, N. Y.,	1892
Benson, Andrew J.,	Chicago, Ill.,	1900
Bernstein, Michael,	Shreveport, La.,	1902
Boyd, Charles N.,	Butler, Pa.,	1900
Cheatham, Thos. A.,	Macon, Ga.,	1890
Clark, John A.,	Hanilton, Can.,	1890
Cone, John W.,	West Hartford, Conn.,	1876
Cresap, Philip P.,	New Orleans, La.,	1904
Ernst, Frank F.,	Jamaica Plain, Mass.,	1891
Faber, Walter E.,	New York, N. Y.,	1900
Goodale, Harvey G.,	Jamaica, N. Y.,	1879
Hagan, John L.,	Danville, Va.,	1905
Hale, Frank P.,	Bellevue, O.,	1906
Hatton, Edgar M.,	Columbus, O.,	1878
Hodgkinson, A. E.,	Devil's Lake, N. Dak.,	1903
Hovey, Will C.,	Chicago, Ill.,	1905
Jaynes, Charles P.,	Boston, Mass.,	1905
Jaynes, Charles W.,	Boston, Mass.,	1905
Jones, Philip M.,	San Francisco, Cal.,	1903
Manns, Albert G.,	Chicago, Ill.,	1905
Merrem, Charles D.,	St. Louis, Mo.,	1901
Mieding, Albert E.,	Milwaukee, Wis.,	1903
Nipgen, Frank M.,	Dayton, O.,	1904
O'Connell, Charles J.,	Minneapolis, Minn.,	1903
Pfaff, Franz,	Boston, Mass.,	1899
Sabin, George C.,	Redfield, S. Dak.,	1906

LIST OF MEMBERS WHO HAVE DIED SINCE LAST REPORT.

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Schreiner, Oswald,	Washington, D. C.,	1900
Shinnick, Joseph R.,	Chicago, Ill.,	1906
Thomasson, Anders,	Lowell, Mass.,	1892
Wichelns, Frederick,	New York, N. Y.,	1881
Wolcott, Frank E.,	Indianapolis, Ind.,	1902

LIST OF MEMBERS WHO HAVE DIED SINCE PUBLICATION OF LAST REPORT.

	Residence.	Elected.
Austin, Wm. C.,	Painesville, O.,	1904
Brock, Gustavus E.,	San Francisco, Cal.,	1905
Burke, William H.,	Detroit, Mich.,	1902
CANNING, HENRY,	Boston, Mass.,	1865
Corring, Albion J.,	Baltimore, Md.,	1898
Drescher, August,	Newark, N. J.,	1905
EMCH, COLUMBUS V.,	Baltimore, Md.,	1863
Field, Claud,	Indianapolis, Ind.,	1890
Hiriart, Sebastian,	Plaquemine, La.,	1891
Ince, Joseph, F. L. S. (Honorary),	London, England,	1882
<i>Kent, Robert R.,</i>	New York, N. Y.,	1855
Lyon, George C.,	Providence, R. I.,	1899
MILLIGAN, DECATUR,	Philadelphia, Pa.,	1867
<i>Ottif, James H.,</i>	Plainfield, N. J.,	1867
<i>J'atten, I. Bartlett,</i>	Boston, Mass.,	1858
Peck, George L.,	Jamaica, N. Y.,	1883
Schmitt, George J. F.,	San Antonio, Tex.,	1890
SHINN, JAMES T.,	Philadelphia, Pa.,	1860
Weber, Peter J.,	St. Louis, Mo.,	1901
Wells, Edwin P.,	Boston, Mass.,	1893
Wetterstrom, Albert F. C.,	Cincinnati, O.,	1888

LIST OF MEMBERS DROPPED FROM THE ROLL FOR NON-PAYMENT OF DUES ACCORDING TO ARTICLE III, CHAPTER VIII, OF THE BY-LAWS.

(PUBLISHED IN ACCORDANCE WITH A GENERAL RULE ADOPTED AT MONTREAL, CAN., AUGUST, 1896. SEE PAGE 17, VOL. 44, PROCEEDINGS.)

	Residence.	Elected.
Albert, Alejandro,	Manila, P. I.,	1904
Allen, Grafton C.,	Port Townsend, Wash.,	1902
Bailey, Leon,	Unknown,	1904
Baillie, Frederick D.,	Willow City, N. Dak.,	1904
Barry, Augustus F.,	Holly Springs, Miss.,	1904
Bartmer, Adolph H.,	Unknown,	1901
Beukema, James A.,	Grand Rapids, Mich.,	1903
Eirdsong, Lafayette F.,	Woodville, Miss.,	1904
Boon, Peyton T.,	Havre, Mont.,	1904
Boutte, Armand V.,	New Iberia, La.,	1904
Brandel, Irwin W.,	Seattle, Wash.,	1903
Brunner, Norman I.,	Macon, Ga.,	1878

Burruss, Morris,	Havre, Mont.,	1904
Capper, William E.,	Boston, Mass.,	1892
Cleveland, Jule M.,	Elberton, Ga.,	1902
Cumberland, Samuel G.,	Muskegee, Okla.,	1904
Darby, Marvin H.,	Florence, Ala.,	1904
D'Avignon, J. Eugene,	Windsor, Can.,	1888
Erwin, Sid A.,	Battle Creek, Mich.,	1904
Faser, Henry M.,	Oxford, Miss.,	1904
Fjfield, Winfield C.,	Des Moines, Ia.,	1904
Fischer, Adolph J.,	Santa Fe, New Mexico,	1904
Gann, Henry,	Columbus, Ga.,	1903
Geary, Richard T.,	Sarnia, Can.,	1904
Hall, Alexander,	Lexington, Ky.,	1904
Hoge, John S.,	Macon, Ga.,	1903
Hood, Reuben C.,	Atlanta, Ga.,	1902
Hopping, Charles E.,	Beaver City, Neb.,	1903
Irvine, Darwin W.,	Salt Lake City, Utah,	1902
Junger, William, F. F.,	Reinbeck, Ia.,	1902
King, Robert B.,	Unknown,	1901
Krewson, William E.,	Philadelphia, Pa.,	1875
Lamar, Henry J.,	Macon, Ga.,	1897
Leonard, Alexander R.,	Stonewall, Can.,	1904
Leslie, William A.,	Morgantown, N. C.,	1902
Lovvorn, James L.,	Bowden, Ga.,	1897
Lutterman, Louis A.,	Cincinnati, O.,	1904
McAleer, Francis A.,	Bokchito, Okla.,	1904
McCormick, Louis C.,	Unknown,	1903
Montgomery, John S.,	Thomasville, Ga.,	1904
Mosely, Lawrence J.,	Tampa, Fla.,	1903
Nagle, Frederick S.,	Wilkes Barre, Pa.,	1904
Osborne, Edward M.,	Lafayette, Ga.,	1904
Packard, Franklin H.,	Redfield, S. Dak.,	1904
Perkins, John S.,	Selma, Ala.,	1904
Phillips, Thomas N.,	Las Animas, Colo.,	1904
Remington, John M.,	Shawnee, Okla.,	1904
Rupp, Harlan E.,	Denver, Colo.,	1904
Schmitt, Walter,	Unknown,	1904
Scott, Walter R.,	Puyallup, Wash.,	1904
Searson, Edwin A.,	Grand Island, Neb.,	1904
Slaughter, Thomas O.,	Waynesboro, Miss.,	1904
Smith, Ben E.,	Sulphur Springs, Tex.,	1904
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Stier, Carl,	Key West, Fla.,	1902
Thompson, Joseph,	Sioux City, Ia.,	1902
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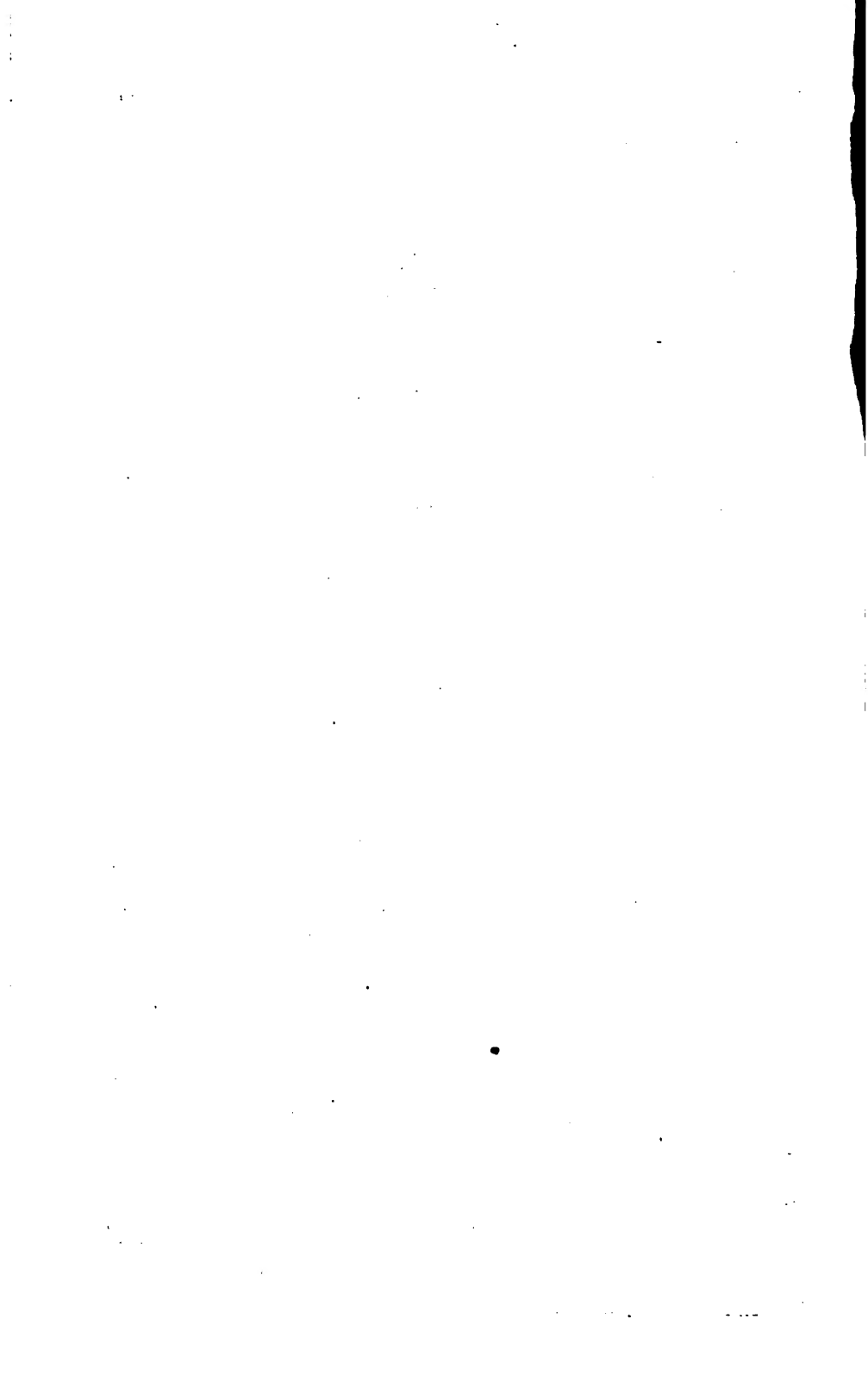
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